Division of Agricultural Sciences
UNIVERSITY OF CALIFORNIA

# FORECASTING PRICES OF SLAUGHTER CATTLE AND HOGS

James B. Hassler



CALIFORNIA AGRICULTURAL EXPERIMENT STATION
GIANNINI FOUNDATION OF AGRICULTURAL ECONOMICS

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# FOREWORD AND APPRAISAL

The collection and distribution of basic agricultural statistics is supported by a few continuing and a larger number of single studies that are directed toward drawing inferences from the primary data. Inferences that may be drawn are of two types, namely, structural quantification and forecasting. Both of these areas are extremely important for general policy decisions and orderly production and marketing. In general, public agencies have hesitated to assume the role of advising agriculture on the significance of the crude data when utilized in inferential analysis. With the proper recognition of possible errors that can be made in such inferential reporting, it is likely that these agencies have underestimated the support that the agricultural industry would give to a continuing activity of this type. Current outlook reports are more "artful" than "analytical" and generally are issued on time period bases that are not useful for decision making. A more thorough integration of data collection and inference reporting, keyed to timely dissemination that could permit individual operators to know the industry position and its consequences so that these individuals can arrive at decisions more compatible with personal and industry interests, is needed. This report is a minor contribution to this problem. It should be expanded to the range level and across the entire livestock-feed economy. Extensions to other unified sectors of agriculture would be in order.

The basic appraisal of this study is left to the reader. A few obvious observations are the following:

1. Sizable errors can be made in the forecasting of cattle and hog prices even though the direction of the trend is predicted.
2. Forecasting is more accurate for periods of relative stability in supplies than for periods of violent change.

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1. Sizable errors can be made in the forecasting of cattle and hog prices even though the direction of the trend is predicted.
2. Forecasting is more accurate for periods of relative stability in supplies than for periods of violent change.

4. Forecasts for the last part of the year are usually more accurate than those for the first part of the year.
5. Because of sizable individual errors, the use of these forecasts would be most appropriate for an operation that expected to continue over a period of many years. The average accuracy would more than offset errors on specific decisions.
6. The effects of the Korean conflict are apparent for late 1950 and the full year of 1951.

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# FORECASTING PRICES OF SLAUGHTER CATTLE AND HOGS

by

James B. Hassler[1/]

## I. Introduction

The research presented in this report is much more restrictive than the title suggests. Specific price forecasts are developed for 900 to 1,100 pound choice slaughter steers and 200 to 220 pound choice slaughter hogs at Omaha and Los Angeles. Potential extensions exist for other grades and classes of slaughter cattle and hogs and for other geographic points, but they have not been covered in this study. Such extensions could be based on relationships to the specific prices considered--both in a geographic as well as a grade and class sense.

The primary objective of this study was the development of a simple, but satisfactory, procedure to forecast monthly average price levels at least six months or more in advance. Information of this nature would have obvious value for feeders in making decisions on replacements and feeding programs. Furthermore, the competitive action of the feed lot operators on the feeder stock market would tend to produce continuously more consistent prices for feeder stock and slaughter stock. This should reduce the amount of windfall losses and gains that occur through time in the livestock industry and should promote more orderly production and marketing patterns.

If price forecasts are widely available to an industry and if the members base their projected plans on these forecasts, there is always the hazard that the forecasts eventually fail to be accurate. An obvious requirement under

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1/ Lecturer in Agricultural Economics and Assistant Economist on the Giannini Foundation and in the California Agricultural Experiment Station, Berkeley.

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by

James D. Hasson[1]

## II. Introduction

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[1] Instructor in Agricultural Economics and Assistant Economist on the [illegible] Station, [illegible] Agricultural Experiment Station, Stillwater, Oklahoma.

such circumstances is that the forecasts be revised periodically to account for the reactions of the market to the forecasts. Biological aspects of cattle and hog production are generally time oriented and irreversible so that this problem does not appear to be too serious. Furthermore, the forecasting structure to be presented relies partially on lagged price levels and trends and thereby indirectly takes account of the above interrelationships between forecasts, decisions, and realized prices.

## II. General Considerations

The purpose of this section is twofold, namely (1) to provide the reader with the broad, logical bases for the forecasting system developed and (2) to outline the system in general terms so that the sequential presentation of its parts will unfold clearly as an integrated structure. Specific comments will be made at relevant points in later sections devoted to the individual components of the system.

### A. General Arguments Pertaining to the Model

#### 1. Economic

The United States livestock and meat industry is essentially a closed system since net imports or exports are relatively insignificant. Furthermore, it is an interdependent national marketing structure with no significant isolated, independent areas. The production-consumption balance for major areas tends to remain stable either as a deficit or a surplus for relatively long periods of time. Price differentials tend to conform to transfer costs in this integrated market structure. Consequently, a single major market point in the general surplus area can be chosen to analyze the effects of national economic factors on the price level for slaughter cattle and hogs. Prices at other geographic points can then be related to those at the chosen markets. It

is in this manner that Los Angeles will be related to Omaha on an annual basis. Monthly variations will be handled separately in each market.

The demand for slaughter livestock is directly derived from the demand of consumers for meat products. On an annual period basis, the time interrelationship is assumed to be simultaneous with respect to production and income. Production is taken as the equivalent of consumption--an assumption more valid for beef than prok--since variations in carry-over storage stocks are small compared with annual volumes. Processing and distribution margins are relatively constant over a short period of years. Consequently, the live animal price for a given grade and class of livestock is approximately equal to the weighted average value of the meat times a relatively constant yield factor and then reduced by a nearly constant margin. On this basis one can bypass the processing and distribution level analyses and relate prices for livestock directly to meat supplies and consumer income. All of these remarks refer to economic considerations on an annual basis. They would be inappropriate for shorter rate periods.

2. Econometric (Economic Models and Quantification Techniques)

The economic structural relationships underlying an industry (or an economy) are exceedingly complex and most models are merely suggestive, simplified approximations. Furthermore, it is quite probable that no structure is stable over lengthly periods of time, and models postulating stability with quantification based on a long-time series of data produce average structural coefficients that have little consistency with current conditions. This would be particularly undesirable if structural change is gradual, nonrandom, and not easily postulated as a function of time.

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The remarks in the last paragraph were directed primarily at the economic functions of a structure but should also be considered for physical interrelationships that are subject to technological change. For these reasons the relationships developed in this report are based on short time series even though such procedures jeopardize the stability of the fitting process through reduced "degrees of freedom." In application through time, it is proposed that the relationships be sequentially recomputed on the basis of dropping a period as new data are available. This procedure should tend to reflect gradual, non-random shifts in the underlying structural relationships.

As stated previously, economic structures are exceedingly complex. The relationships in the system presented in this report are not expected to be more than a logical, but arbitrary, representation. Consequently, for some relationships (primarily the multivariable functions) only linear forms are employed even though more complicated mathematical functions might be appropriate. This simplification is not a serious problem since our primary interest is price forecasting and not structural identification. Furthermore, since it was decided that short time periods should be used, a linear spanning of the localized space should be a reasonable approximation and is more easily accomplished.

The system developed is self-projecting, that is, primary forecasts are dependent on secondary forecasts that are functions of currently available lagged data. Any model to be used for forecasting must have this property, and the system of equations should be established in this manner as the first step. The next step is to quantify the structure using realized data of the past. Forecasts of primary

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The "monthly" model is essentially nonstructural in a direct economic sense. This does not mean that it is noneconomic. Rather, it is economic but in an indirect, mechanical sense. The monthly analysis is keyed to the annual analysis with the latter setting the general level for the monthly sequences.

Primary components of the monthly model are (1) monthly sequences must be consistent with forecasts of annual average price levels, (2) monthly sequences are well represented by linear runs with critical pivotal points such as April and November (intrasequence) and January and August (intersequence), and (3) the linear runs are computed so as to be consistent with the annual forecasts, the recent price trends, and some measure of seasonality. A secondary, but basic, argument for the procedures used in making the monthly estimates is that the paths of monthly prices tend to be compensatory in their fluctuations around the annual level. These compensating fluctuations are especially relevant for cattle and are probably a function of irreversible ordering of slaughter and the progressive removal of optimism or pessimism generated by market uncertainty. More details about the monthly price forecasting technique will be given later.

Thus far, the discussion in this section has been directed at the concept of a forecasting model. The method of model quantification and the appraisal basis for the results must be considered. These two problems are integral parts of the basic specifications of an economic model, that is, every economic model that is to be quantified must have

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economic specifications and error specifications. The error specifications are essential for the determination of the appropriateness of the quantification method and the terminal appraisal (statistical) of the results. Books have been written (and many more will be written) that have been singularly devoted to these problems of quantitative economics. It is hoped that the brevity of this discussion will not be considered synonymous with naivety--they are extremely important subjects and should never be disregarded. The assumption of a stationary time series (essential for a meaningful definition of the fundamental probability distribution for the error specification) is placed under extreme pressure with the dynamic passage of time and especially for forecasting models. Even for models that are logically consistent in their economic and error specifications, the statistical appraisal of their estimates hinges on this concept of a stable probability distribution for the errors. It is a serious weakness of most econometric models that have been developed. Recent work in the area of stockastic processes may provide more flexible and appropriate procedures. The path of economic activity running into the future and its structural connection with the present and past will undoubtedly challenge economists for many years to come, especially with respect to specific details and dynamic components.

In this report error specifications are omitted. The "least squares" procedure was employed to quantify the functions involved. The common statistical measures have been computed for these regression functions and were used only for their descriptive value. Their probabilistic significance was ignored. This attitude was intentional, based partly on the problems pointed out above and partly on the extreme

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difficulty of employing them to support the terminal estimates. These terminal estimates are functions of a pyramid of preliminary estimates and the problem of their error specification as functions of primary assumptions is nearly impossible. Consequently, no probability statements are made about the multitude of estimates involved. A rather crude, but reasonable, philosophy was developed to replace this deficiency, namely, the acceptability of the procedure must rest on the results of a period of application. Each reader must decide this issue. Two considerations would be uppermost. Do the results appear to be sufficiently stable and accurate over a period of application? Will this observable stability hold into the future? Probablistically based confidence intervals for the estimates might be an aid but perhaps of no more value than the specific results over a trial period.

B. General Outline of the Forecasting Model

Although the principal objective of this study was the development of monthly average prices, it was found that the forecasting of annual average levels was a necessary and fundamental requirement. Biological aspects of livestock production and the psychological attitudes of people in their economic outlook are keyed to the calendar year. Fundamental data are collected and presented on this basis. Consequently, the calendar year is the annual period used.

In general, three sets of estimates (both annual and monthly) are developed, namely, preliminary, revised, and final. The year is broken into two parts for the monthly forecast sequences--January through July and August through December. For the annual forecasts, a preliminary forecast is made in early August for the coming year, a revised estimate is made in early February, and a final estimate is made in August. For the monthly forecasts, the following estimates are made at the calendar points specified.

| Calendar points | Forecasts |
|---|---|
| 1. Early August | Final forecasts for August-December<br>Preliminary forecasts for January-July |
| 2. Early December | Revised forecasts for January-July |
| 3. Early February | Final forecasts for February-July<br>(Note that January is missed.)<br>Preliminary forecasts for August-December |
| 4. Early May | Revised final forecasts for May-July |
| 5. Early June | Revised forecasts for August-December |

Monthly forecasts for both cattle and hogs are made up of two linear segments that pivot on April for the January (February) through July period. Forecasts for cattle during the August through December period follow a single straight line while those for hogs are linear to November with December equal to the previous month's estimate. The annual forecasts are used to insure that the monthly forecasts are consistent with them. The exact details of the procedures that tie the annual and monthly forecasts together will be given later.

Preliminary and revised annual forecasts are computed from two basic equations that are functions of forecasted production per capita of beef plus veal and pork and per-capita disposable income. These results are for the Omaha market as a point in the national structure. Comparable results for Los Angeles are secured from relationships connecting the two markets--one for cattle and one for hogs.

The final annual forecasts (made in early August) for each market are computed from relationships between annual prices and average prices for May, June, and July. This is an indirect economic structure and relies on price levels during these three months to reflect earlier price levels and those for the remainder of the year.

It should be obvious that all of these relationships must be quantified from past data and must either use lagged data or forecasted values in their application. The remainder of the report will be devoted to the development of the relationships and the forecasted results. Most of the relationships employ data for 1947-1955 or 1949-1955 with 1951 being omitted for some of the value functions. Using the relationships as they would be in actual forecasting, results are given for the 1949-1955 period. These cannot be considered "forecasts" since they are estimated for the period of data used in quantifying the system. Results for 1956 and 1957 are actual forecasts.

That which follows is comprised of three major parts (1) the quantification of the relationships for the annual model, (2) the use of these relationships in making annual forecasts, and (3) the development of the monthly forecasts. A list of definitions for the symbols used will now be given. A loose copy of these definitions has been provided to assist the reader in following the graphs and tables. This makes it unnecessary to repeat these definitions at various points throughout the text and greatly simplifies the notation on graphs and tables.

C. Definitions

$P_{BO}$ = Annual average price per hundredweight for 900 to 1,100 pound choice slaughter steers at Omaha (dollars).

$P_{HO}$ = Annual average price per hundredweight for 200 to 220 pound choice slaughter hogs at Omaha (dollars).

$X_2$ = Annual per-capita production of beef and veal in the United States (pounds).

$X_3$ = Annual per-capita production of pork (excluding lard) in the United States (pounds).

$X_1 = \frac{P_{BO}X_2 + P_{HO}X_3}{100}$ = Annual value of beef, veal, and pork per-capita production when computed with live prices $P_{BO}$ and $P_{HO}$ (dollars).

$X_1^* = P_{BO}/P_{HO}$ = Ratio of annual average prices defined above.

$X_4$ = Annual per-capita disposable income in the United States (dollars).

$X_5$ = Total annual production of beef and veal in the United States ($10^9$ pounds).

$X_6$ = Total cattle on farms on January 1 in the United States ($10^6$ animals). Lagged one year relative to $X_5$.

$X_7$ = Total federally inspected slaughter of beef and veal for January-June in the United States ($10^9$ pounds).

$X_8$ = Total fall pigs saved in the United States ($10^6$ animals).

$X_9$ = Total spring pigs saved in the United States ($10^6$ animals).

$X_{10}$ = Total spring pigs saved in the United States ($10^6$ animals). $X_{10}$ is used in lieu of $X_9$ at this point to stress that it is being used as the dependent variable. In a temporal sense, $X_9$ and $X_{10}$ are related by the following relationship, $X_{10,t} = X_{9,t+1}$.

$X_{11}$ = Ratio of fall pigs saved to spring pigs saved in a given year times the annual average hog/corn price ratio (Chicago basis) for a given year. Lagged one year relative to $X_{10}$.

$X_{12}$ = Total annual production of pork (excluding lard) in the United States ($10^9$ pounds).

$X_{13}$ = 20 per cent of spring pigs saved in previous year plus fall pigs saved in previous year plus 80 per cent of spring pigs saved in current year ($10^6$ animals). "Previous" and "current" are relative to the time period for $X_{12}$.

$X_{14}$ = Total federally inspected slaughter of pork (excluding lard) for January-June in the United States ($10^9$ pounds).

$\bar{P}_{BO,567}$ = May-July average price per hundredweight for 900 to 1,100 pound choice slaughter steers at Omaha (dollars).

$\bar{P}_{HO,567}$ = May-July average price per hundredweight for 200 to 220 pound choice slaughter hogs at Omaha (dollars).

$P_{BLA}$ = Same as $P_{BO}$ but for Los Angeles.

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$p_1, p_2, \ldots, p_{12}$ are used in various tables and are monthly average prices. The context will make it clear whether they refer to cattle or hogs at Omaha or Los Angeles and to actual prices or forecasts.

Primed notation will indicate estimates for all variables other than $p_1, p_2, \ldots, p_{12}$.

## III. Development of the Annual Forecasting Structure

### A. The Annual Model and Its Quantification (Omaha Market)

For the preliminary, revised, and final estimates (1) of $P_{BO}$ and $P_{HO}$, two basic equations were employed. These equations are interdependent but were quantified separately. In quantified form, they are as follows:

$$X_1 = 87.751208 - .486749X_2 - .657893X_3 + .020241X_4 \qquad \text{(Equation 1)}$$

$$X_1^* = 4.688117 + .007649X_2 + .075675X_3 + .000211X_4 \qquad \text{(Equation 2)}$$

From the definitions of $X_1$ and $X_1^*$, it can be seen that, if $X_2$, $X_3$, and $X_4$ are known, then $X_1'$ and $X_1^*$ can be computed and the relationship between $X_1$ and $X_1^*$ will permit the computation of $P_{BO}$ and $P_{HO}$. For instance, assume that $X_1' = k_1$ and $X_1^{*\prime} = k_1^*$ have been estimated where $k_1$ and $k_1^*$ are specific values. Then, $P_{BO} = k_1^* P_{HO}$ results from the definition of $X_1^*$. Substituting in $\frac{P_{BO}X_2 + P_{HO}X_3}{100} = k_1$, we secure $P_{HO} = \frac{100\ k_1}{k_1^*X_2 + X_3}$ which permits us to compute $P_{HO}$. Then, $P_{BO}$ will be $k_1^*$ times our answer for $P_{HO}$.

For the procedure to be rational, equations 1 and 2 should be automomous in an economic sense. Equation 1 can be thought of as an expenditure function, and equation 2 is a relative price function. Variables $X_2$, $X_3$, and $X_4$ can be considered as predetermined or exogenous variables. From the mathematical relationships connecting $X_1$ and $X_1^*$ through $P_{BO}$, $P_{HO}$, $X_2$, and $X_3$, it is possible to convert equations 1 and 2 into two other functions (rather complex) expressing $P_{BO}$ and $P_{HO}$ directly as functions of $X_2$, $X_3$,

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$X_9$ = Total spring pigs saved in the United States ($10^6$ animals).

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$X_{11}$ = Ratio of fall pigs saved to spring pigs saved in a given year times the annual average hog/corn price ratio (Chicago basis) for a given year. Lagged one year relative to $X_{10}$.

$X_{12}$ = Total annual production of pork (excluding lard) in the United States ($10^9$ pounds).

[illegible]

[illegible]

$P_{10}$ = Annual average price per hundredweight for 200 to 250 pound spring chicken slaughter steers at Omaha (dollars).

$P_{11}$ = Annual average price per hundredweight for 200 to 250 pound spring chicken slaughter hens at Omaha (dollars).

$R_1$ = Annual per-capita production of beef and veal in the United States (pounds).

$R_2$ = Annual per-capita production of pork (excluding lard) in the United States (pounds).

$R_3$ = $\frac{P_{10}R_1 + P_{11}R_2}{100}$ = Annual value of beef, veal, and pork consumed per circle when converted into the prices $P_{10}$ and $P_{11}$ (dollars).

$R_4$ = $\frac{P_{10}}{P_{11}}$ = Ratio of annual average prices defined above.

$R_5$ = Annual per-capita disposable income in the United States (dollars).

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$R_7$ = Total cattle on farms on January 1 in the United States ($10^6$ animals). Lagged one year relative to $R_6$.

$R_8$ = Total federally inspected slaughter of beef and veal for January-June in the United States ($10^6$ pounds).

$R_9$ = Total "all plus" cows in the United States ($10^6$ animals).

$R_{10}$ = Total spring pigs saved in the United States ($10^6$ animals).

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$$R_{10,t} = R_{9,t-1} + I$$

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$X_{14}$ = Total federally inspected slaughter of pork (excluding lard) for January-June in the United States ($10^9$ pounds).

$\bar{p}_{BO,567}$ = May-July average price per hundredweight for 900 to 1,100 pound choice slaughter steers at Omaha (dollars).

$\bar{p}_{HO,567}$ = May-July average price per hundredweight for 200 to 220 pound choice slaughter hogs at Omaha (dollars).

$P_{BLA}$ = Same as $P_{BO}$ but for Los Angeles.

$P_{HLA}$ = Same as $P_{HO}$ but for Los Angeles.

$\bar{p}_{BLA,567}$ = Same as $\bar{p}_{BO,567}$ but for Los Angeles.

$\bar{p}_{HLA,567}$ = Same as $\bar{p}_{HO,567}$ but for Los Angeles.

$p_1, p_2, \ldots, p_{12}$ are used in various tables and are monthly average prices. The context will make it clear whether they refer to cattle or hogs at Omaha or Los Angeles and to actual prices or forecasts.

Primed notation will indicate estimates for all variables other than $p_1, p_2, \ldots, p_{12}$.

and $X_4$. If this were done, the economic interpretation would be complicated as well as the computational problem of fitting. The problem will not be argued further but suffice it to say that the terminal results would differ in the two cases.[1/] Figures 1, 2, 3, and 4 show how well equations 1 and 2 describe the data for the period used in their quantification.

With these preliminary remarks, it should be clear that the use of equations 1 and 2 in making forecasts of $P_{BO}$ and $P_{HO}$ is contingent on knowing values (forecasts) of $X_2$, $X_3$, and $X_4$. We shall turn now to the problem of making these secondary forecasts. Especially for $X_2$ and $X_3$ (but partly for $X_4$) it is more convenient to forecast total production (disposable income) and total population values to compute the per-capita levels than to estimate the latter directly.

1. Population Forecasting (Including Armed Forces Overseas)

The preliminary forecast would be made in August and not revised in February. On the following August, the official, preliminary July 1 estimate of the Bureau of the Census would be used as a final estimate. The preliminary forecast is based on a ratio estimator.

Let $N_i$ be the preliminary official estimate for July 1 issued by the Bureau of the Census. Let $N_{i-1}$ be the revised official estimate for the previous year. Then, the estimate for the year i + 1 is given by $N_{i+1} = \left(\frac{N_i}{N_{i-1}}\right) N_i$. The results of this procedure are given in Table 1 at a later and more useful position.

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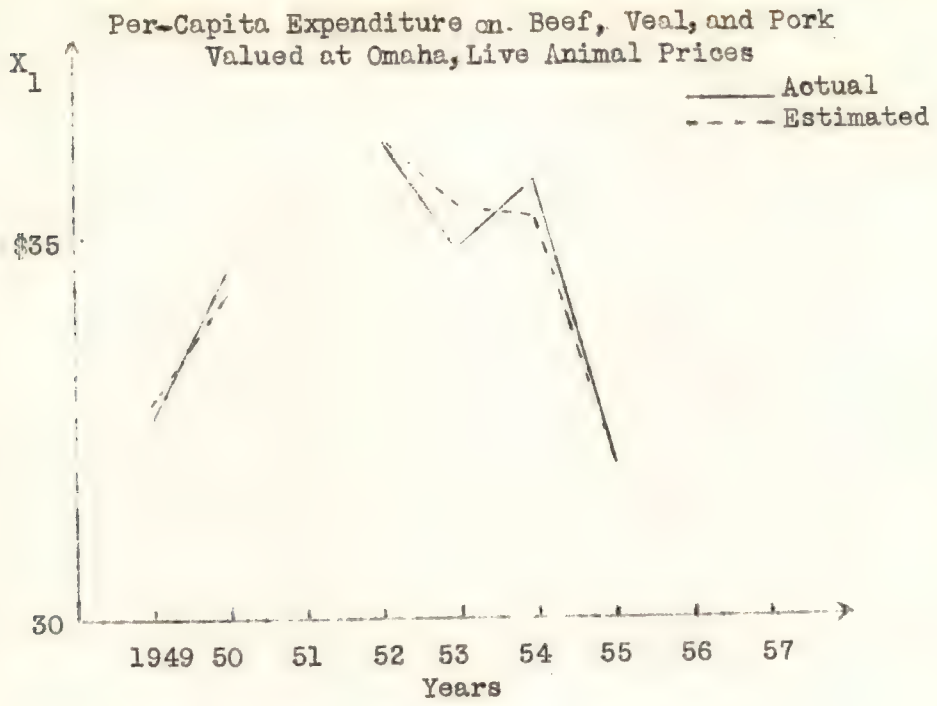
1/ Two linear price functions (one for $P_{BO}$ and one for $P_{HO}$) were tried but discarded. Both resulted in poor consistency for 1955.

FIGURE 1




Equation 1

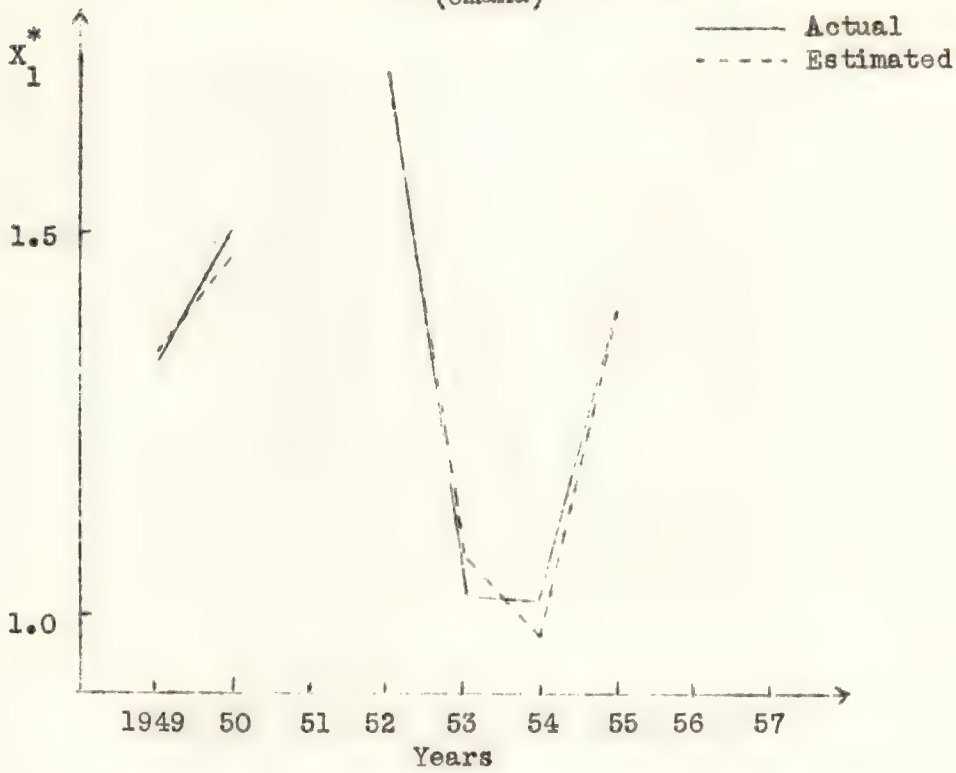
$$X_1' = 87.751208 - .486749X_2 - .657893X_3 + .020241X_4$$

(-6.08) (-4.90) (5.74) $\bar{R}^2 = .878632$

| Data | $X_1$ | $X_2$ | $X_3$ | $X_4$ |
|---|---|---|---|---|
| 1949 | 32.60 | 72.2 | 68.9 | 1261 |
| 50 | 34.57 | 71.0 | 70.6 | 1359 |
| 52 | 36,29 | 69.0 | 73.5 | 1508 |
| 53 | 34.83 | 87.6 | 63.0 | 1568 |
| 54 | 35.76 | 90.2 | 61.3 | 1569 |
| 55 | 32.01 | 92.1 | 66.7 | 1628 |

FIGURE 2

Ratio of Choice Steer and Hog Prices
(Omaha)




Equation 2

$$X_1^* = -4.688117 + .007649X_2 + .075675X_3 + .000211X_4$$

(1.08) (6.34) (.67) $\bar{R}^2 = .963095$

| Data | $X_1^*$ |
|---|---|
| 1949 | 1.330 |
| 50 | 1.506 |
| 52 | 1.719 |
| 53 | 1.027 |
| 54 | 1.017 |
| 55 | 1.409 |

($X_2$, $X_3$, $X_4$ are on Figure 1)

FIGURE 3

Annual Average Prices for 900 to 1,100 Pound Choice Slaughter Steers at Omaha

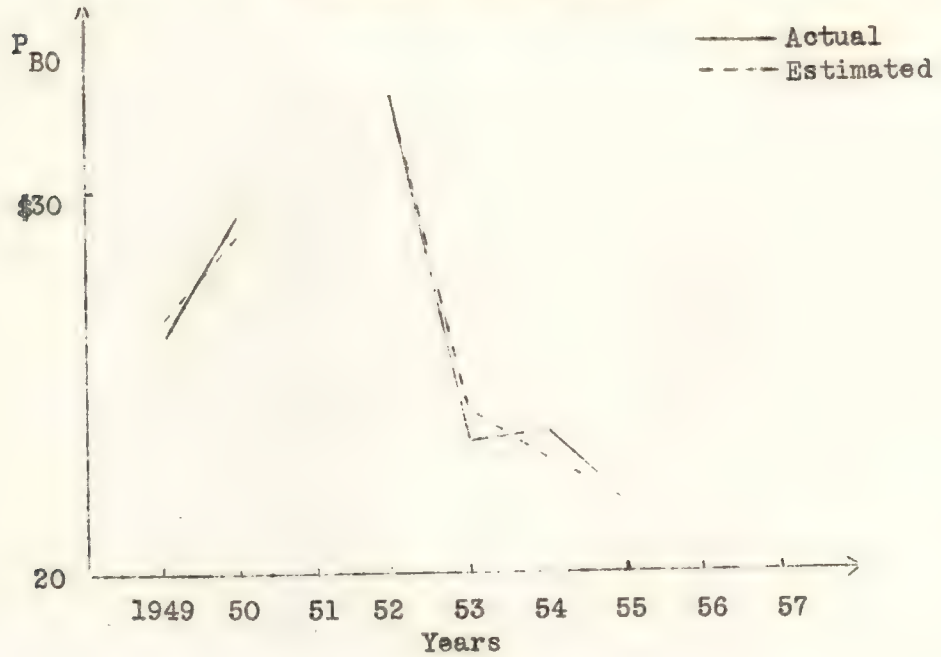
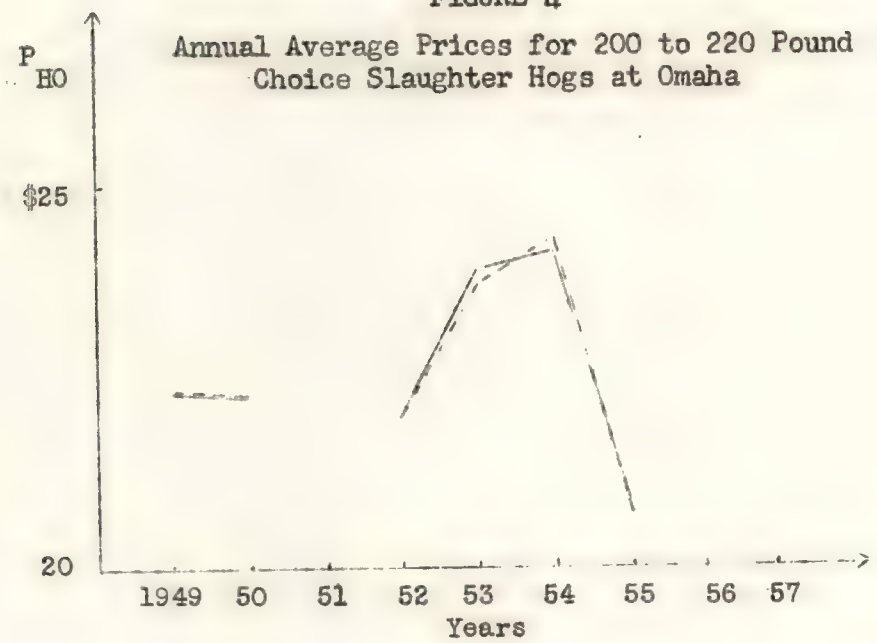



FIGURE 4

Annual Average Prices for 200 to 220 Pound Choice Slaughter Hogs at Omaha



2. Forecasting Total Beef and Veal Production

The preliminary and revised forecasts of total beef and veal production ($X_5$) are based on the lagged number of cattle on farms ($X_6$). Data of this type go through many stages of revision by the U. S. Department of Agriculture. The usual procedure is to issue preliminary reports, then revise the values shortly thereafter, and finally to revise entire series at periodic points connected with better information from censuses and other sources. The following relationship is based on the most recent revised series:

$$X_5' = -10.381911 + .267750X_6 \qquad \text{(Equation 3)}$$

Figure 5 shows how well this function fits the fundamental data. In practice, preliminary and revised values of $X_6$ would be employed as they develop over time.

Final forecasts of $X_5$ are based on total federally inspected production for the period January through June ($X_7$) as given by the following equation:

$$X_5' = 1.118299 + 2.631390X_7 \qquad \text{(Equation 4)}$$

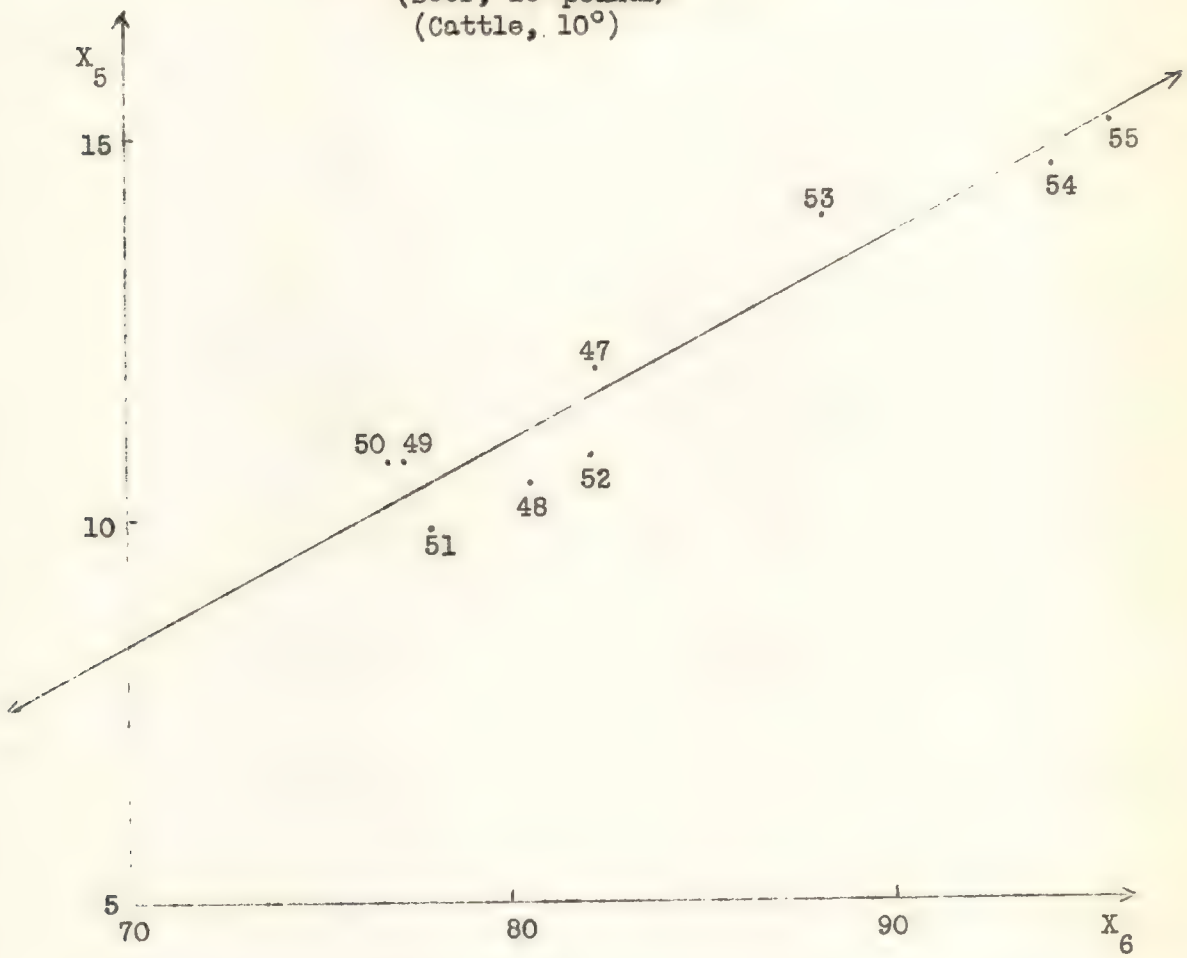
Figure 6 shows how consistent this equation is with the basic data.

3. Forecasting Total Pork Production (Excluding Lard)

Although pig production is less seasonal than in earlier years, there still remains a strong tendency to produce in spring and fall cycles. Pig crop reports reflect this fact. Neglecting the compensations that are involved in culling and replacement activities, it has been assumed that pork production should be directly related to the size of the pig crops. Pig development to the marketing weight considered desirable (200 to 220 pounds) requires a period of six to nine

FIGURE 5

Total Beef and Veal Production in Relation to Lagged Cattle
on January 1 of Previous Year
(Beef, $10^9$ pounds)
(Cattle, $10^0$)



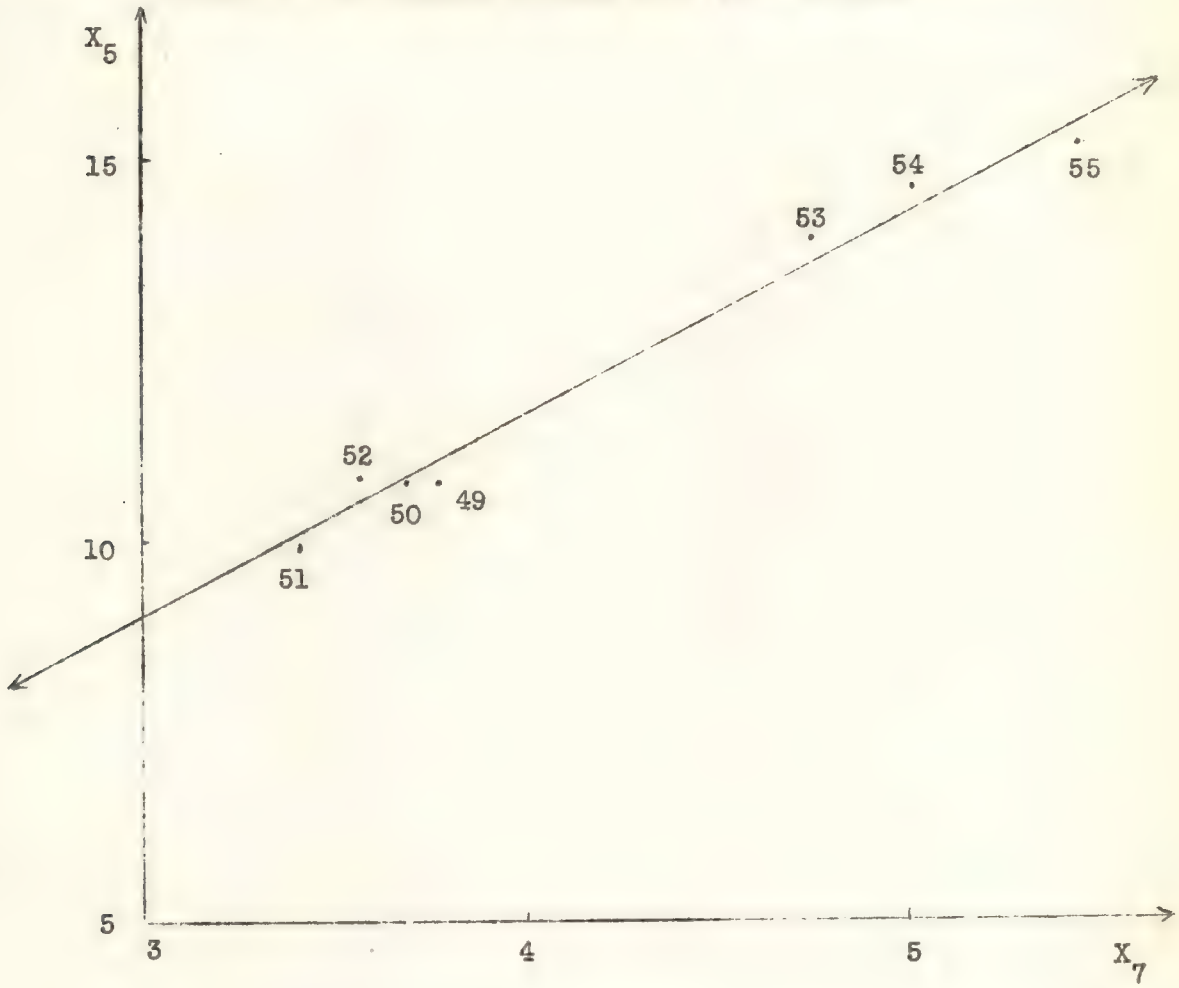

Equation 3

$X'_5 = -10.381911 + .267750X_6$ $\qquad r = .955682$

| Data | $X_5$ | $X_6$ |
|---|---|---|
| 1947 | 12.037 | 82.235 |
| 48 | 10.498 | 80.554 |
| 49 | 10.773 | 77.171 |
| 50 | 10.768 | 76.830 |
| 51 | 9.904 | 77.963 |
| 52 | 10.840 | 82.083 |
| 53 | 13.989 | 88.072 |
| 54 | 14.647 | 94.241 |
| 55 | 15.212 | 95.679 |

FIGURE 6

Total Beef and Veal Production in Relation to Federally Inspected Slaughter for January Through June ($10^9$ Pounds)




Equation 4

$X'_5 = 1.118299 + 2.631390X_7$ $\qquad$ $r = .992819$

| Data | $X_5$ | $X_7$ |
|---|---|---|
| 1949 | 10.773 | 3.772 |
| 50 | 10.768 | 3.684 |
| 51 | 9.904 | 3.408 |
| 52 | 10.840 | 3.567 |
| 53 | 13.989 | 4.755 |
| 54 | 14.647 | 5.116 |
| 55 | 15.212 | 5.456 |

months. Consequently, the pork production of a given year was assumed to be related to the aggregate pig crop formed by adding 20 per cent of the lagged spring crop plus all of the lagged fall crop and 80 per cent of the current spring crop.

Initially, one must forecast the necessary parts of this aggregate. For the preliminary forecast made in August, the size of the fall crop and the coming spring crop must be estimated. The revised forecast of pork production made in February will only necessitate the foreword estimation of the spring crop. Relationships which follow are based on final revised time series. In application, the preliminary and initially revised values of the variables would be employed.

Fall pigs saved ($X_8$) can be estimated from the size of the current spring crop ($X_9$) by the following equation:

$$X_8' = -6.184680 + .752821X_9 \qquad \text{(Equation 5)}$$

Figure 7 gives a graphic representation of this function in relation to the basic data.

To forecast the next spring crop ($X_{10}$), the following equation was developed:

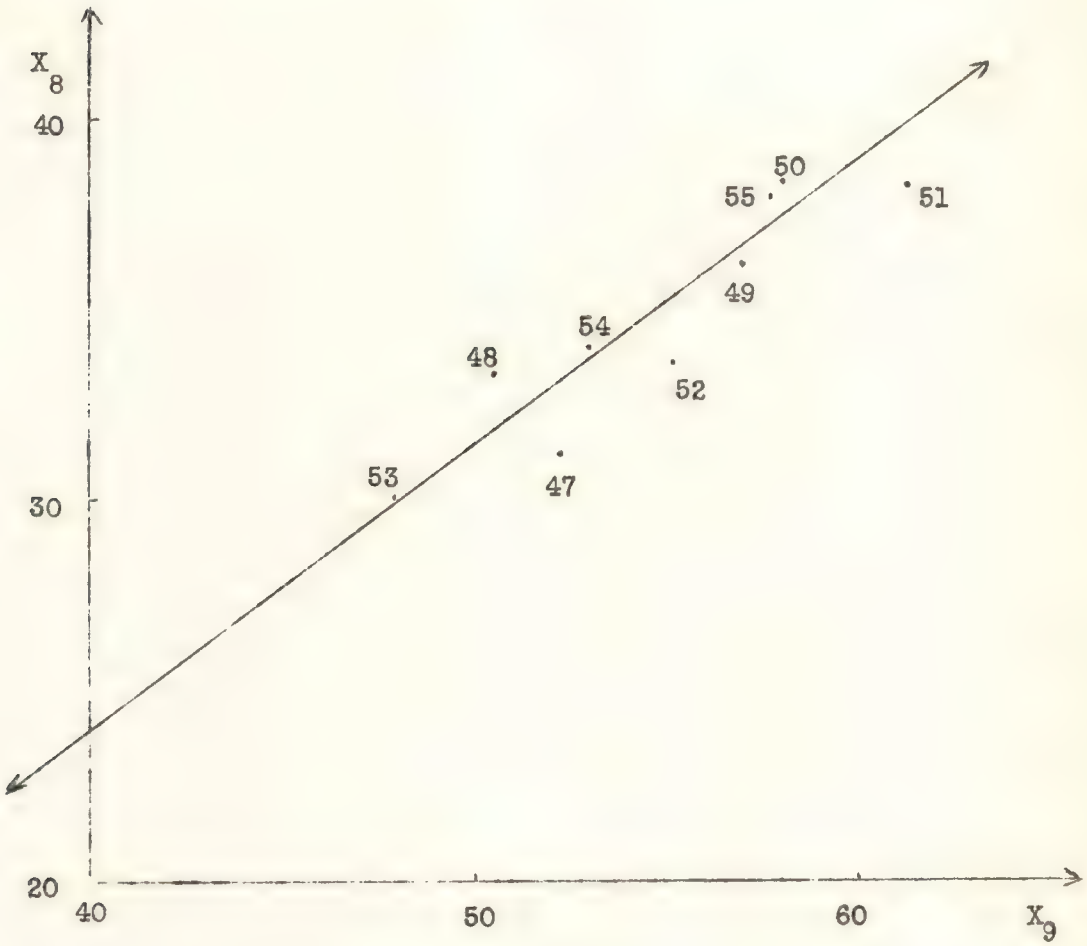
$$X_{10}' = 3.223202 + .744382X_8 + 3.122504X_{11} \qquad \text{(Equation 6)}$$

where $X_8$ is fall crop and $X_{11}$ is the product of the ratio of $X_8/X_9$ times the annual average hog/corn price ratio on a Chicago basis.

In application, this poses several problems, namely, neither $X_8$ nor $X_{11}$ will be known by August. The value of $X_8$ given by equation 5 can be used. Equation 5 can be rewritten as $X_8/X_9 = .752821 - \frac{6.184680}{X_9}$. In an ex post analysis, it was found that the annual hog/corn ratio could be expressed as a function of the average hog/corn ratio for May through July as follows:

FIGURE 7

Fall Pigs in Relation to Lagged Spring Pigs Saved ($10^6$)




Equation 5

$X'_8 = -6.184680 + .752821X_9$ $\qquad r = .920658$

| Data | $X_8$ | $X_9$ |
|---|---|---|
| 1947 | 31.090 | 52.199 |
| 48 | 33.358 | 50.468 |
| 49 | 36.275 | 56.969 |
| 50 | 39.423 | 57.958 |
| 51 | 39.288 | 61.298 |
| 52 | 33.694 | 55.135 |
| 53 | 29.974 | 47.940 |
| 54 | 33.978 | 52.852 |
| 55 | 38.029 | 57.690 |

For 1947 and 1948 H/C (annual) = 1.133929 H/C (May-July)

For 1949-1955 H/C (annual) = .944734 H/C (May-July)

Consequently, these results can be combined to yield:

For 1947 and 1948 $X_{11}$ = H/C (May-July) $\left[.854603 - \frac{7.046804}{X_9}\right]$

For 1949-1955 $X_{11}$ = H/C (May-July) $\left[.712013 - \frac{5.871051}{X_9}\right]$

with the latter being used for future extensions. By February direct values of $X_8$ and $X_{11}$ would be available.

Figure 8 shows the ex post relationship using final revised time series for the quantification of equation 6.

Total pork production ($X_{12}$) as a function of total pigs saved with an 80-per cent to 20-per cent split of the spring crop ($X_{13}$) is given by

$$X'_{12} = 3.522055 + .080028X_{13} \qquad \text{(Equation 7)}$$

This function is illustrated by Figure 9 and would be used for preliminary and revised forecasts by employing the consistent values for $X_{13}$. The preliminary forecast (made in August) would involve the use of the preliminary U. S. Department of Agriculture report on spring pigs saved. This report (by ex post observation) appears to be slightly biased and was adjusted by the following equation:

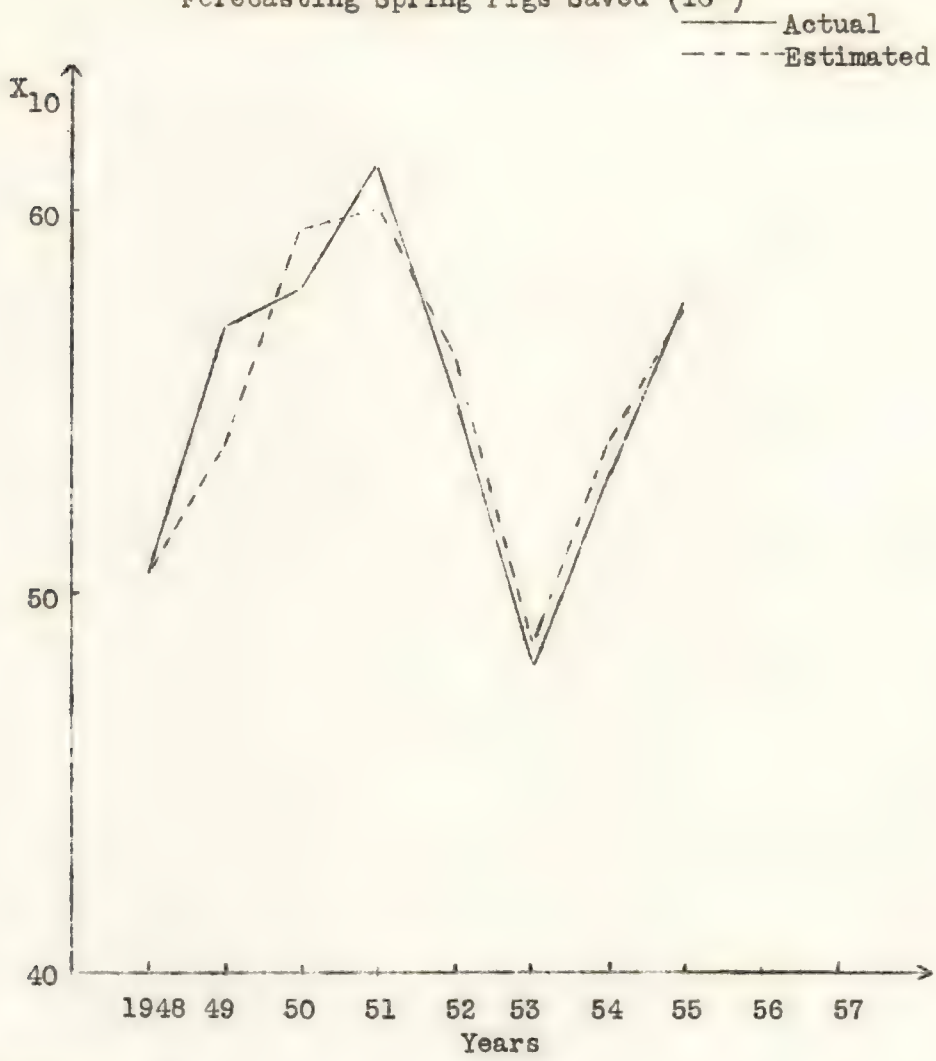
Adjusted spring pigs saved = 2.228235 + .923236 (preliminary spring pigs saved) with values expressed in millions of animals.

A similar adjustment was made for the preliminary fall pigs saved as reported by the U. S. Department of Agriculture (for use in the revised estimate of $X_{12}$) by means of

Adjusted fall pigs saved = -.378077 + .974443 (preliminary fall pigs saved).

FIGURE 8

Forecasting Spring Pigs Saved ($10^6$)




Equation 6

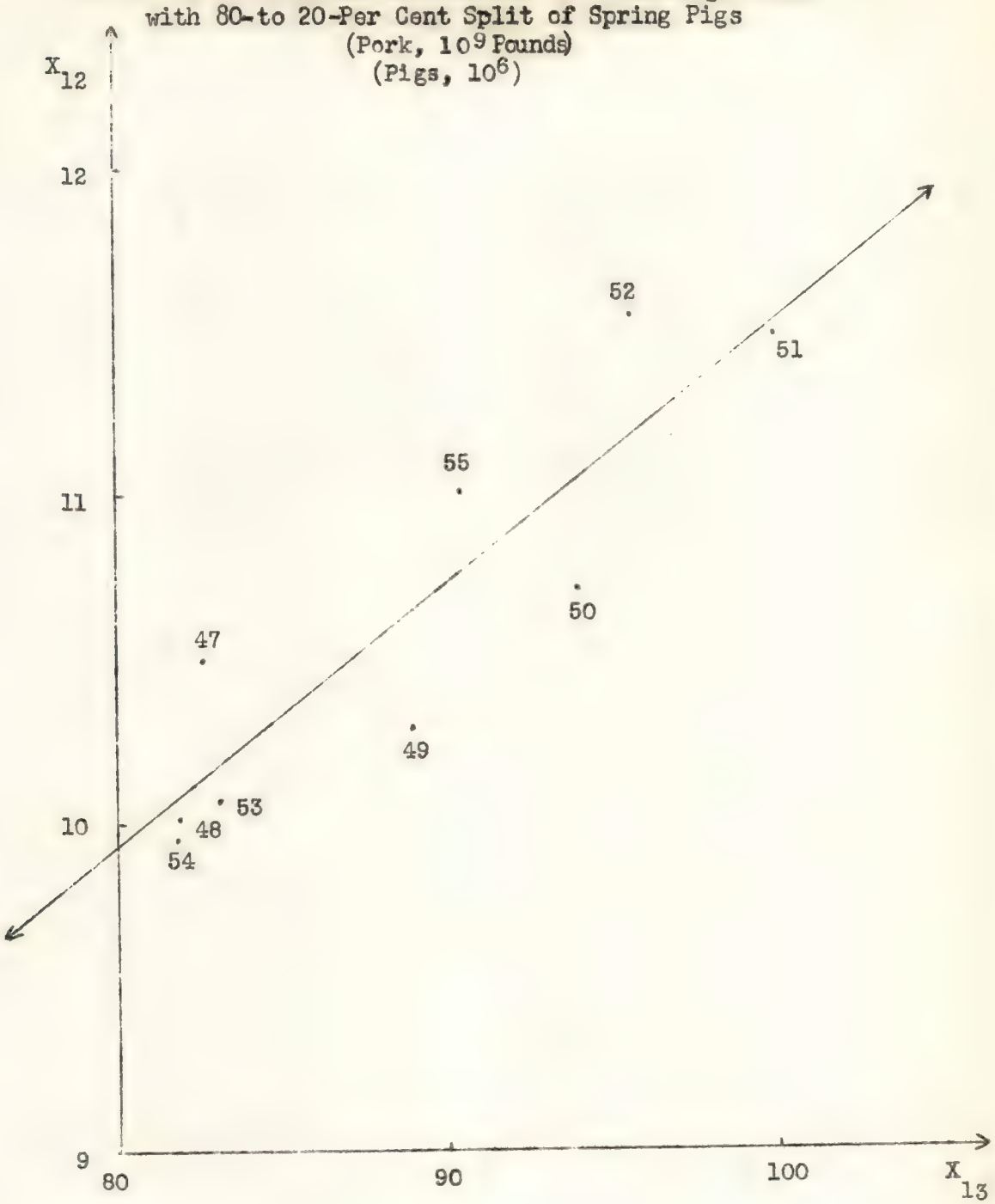
$$X'_{10} = 3.223202 + .744382X_8 + 3.122504X_{11}$$

(3.83) (4.68) $\bar{R}^2 = .833854$

| Data | $X_{10}$ | $X_8$ | $X_{11}$ |
|---|---|---|---|
| 1948 | 50.468 | 31.090 | 7.7 |
| 49 | 56.969 | 33.358 | 8.3 |
| 50 | 57.958 | 36.275 | 9.4 |
| 51 | 61.298 | 39.423 | 8.8 |
| 52 | 55.135 | 39.288 | 7.6 |
| 53 | 47.940 | 33.694 | 6.5 |
| 54 | 52.852 | 29.974 | 9.1 |
| 55 | 57.690 | 33.978 | 9.3 |

FIGURE 9

Total Pork Production in Relation to Total Pigs Saved
with 80- to 20-Per Cent Split of Spring Pigs
(Pork, $10^9$ Pounds)
(Pigs, $10^6$)




Equation 7

$X'_{12} = 3.522055 + .080028X_{13}$ $\qquad r = .892621$

| Data | $X_{12}$ | $X_{13}$ | | $X_{12}$ | $X_{13}$ |
|---|---|---|---|---|---|
| 1947 | 10.502 | 82.700 | 1951 | 11.483 | 100.053 |
| 48 | 10.055 | 81.904 | 52 | 11.547 | 95.656 |
| 49 | 10.286 | 89.027 | 53 | 10.063 | 83.073 |
| 50 | 10.714 | 94.035 | 54 | 9.952 | 81.844 |
| | | | 55 | 11.016 | 90.422 |

Equation 7 could be used for making a final forecast of total pork production, but it was found that the total federally inspected slaughter for January through June ($X_{14}$) was more reliable. This relationship is given by:

$$X_{12}' = 3.626958 + 1.852960X_{14} \qquad \text{(Equation 8)}$$

and is illustrated by Figure 10.

4. Forecasting Per-Capita Disposable Income

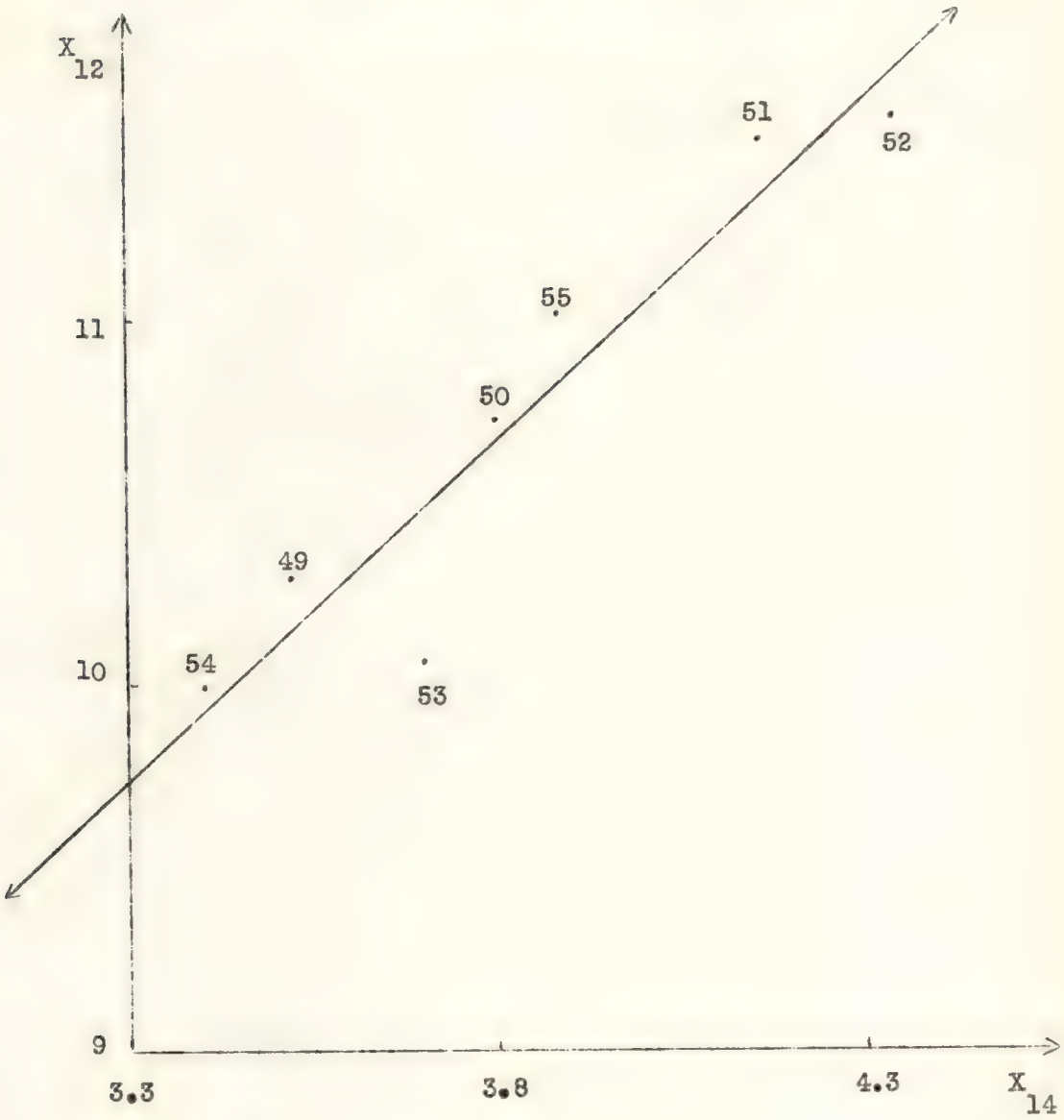
In August of a given year, we would be interested in forecasting next year's average per-capita disposable income. Although more elaborate, economic methods might be developed, we have resorted to a simple temporal trend projection. It can be stated that a revision (lowering) of the growth rate employed probably will have to be made in the future. For the years 1949 through the near future, the following methods was employed. Starting with $X_4$ = 1,279 in 1948, this value was expanded successively by multiplying by 1.035 (a 3.5-per cent annual increase). The results of this method are as follows:

| Year | Actual $X_4$ | Projected $X_4$ |
|---|---|---|
| 1949 | 1,261 | 1,324 |
| 1950 | 1,359 | 1,370 |
| 1951 | 1,465 | 1,418 |
| 1952 | 1,508 | 1,468 |
| 1953 | 1,568 | 1,519 |
| 1954 | 1,569 | 1,572 |
| 1955 | 1,628 | 1,627 |

The projected $X_4$ values would not be changed for the series of February estimates. By the following August, a final estimate of $X_4$ would be made.

FIGURE 10

Total Pork Production in Relation to Federally Inspected Slaughter for January Through June ($10^9$ Pounds)




Equation 8

$X'_{12} = 3.626958 + 1.852960X_{14}$ $\qquad r = .946075$

| Data | $X_{12}$ | $X_{14}$ |
|---|---|---|
| 1949 | 10.286 | 3.522 |
| 50 | 10.714 | 3.796 |
| 51 | 11.483 | 4.161 |
| 52 | 11.547 | 4.341 |
| 53 | 10.063 | 3.699 |
| 54 | 9.952 | 3.404 |
| 55 | 11.016 | 3.884 |

It has been observed that the value of $X_4$ (on annual, seasonally adjusted basis) for the second quarter of the year is a very good indication of the value of $X_4$ for the entire year. The value of $X_4$ for the second quarter is computed from the reported total disposable income rate that is released by the Department of Commerce and from the interpolated (centered on May) population estimate based on a linear trend between July 1 of the previous year and July 1 of the current year. Using final revised population and disposable income figures, the following results were developed:

| Year | Actual $X_4$ | Estimated second quarter $X_4$ |
|---|---|---|
| 1948 | 1,279 | 1,280 |
| 1949 | 1,261 | 1,269 |
| 1950 | 1,359 | 1,326 |
| 1951 | 1,465 | 1,460 |
| 1952 | 1,508 | 1,491 |
| 1953 | 1,568 | 1,575 |
| 1954 | 1,569 | 1,567 |
| 1955 | 1,628 | 1,620 |

5. Final Forecasting (2) of $P_{BO}$ and $P_{HO}$

It has been found that more accurate final estimates of $P_{BO}$ and $P_{HO}$ can be made by the use of the average price levels for May through July than by relying on equations 1 and 2. Unique marketing conditions developing during a given year appear to be more accurately reflected by this procedure. The following equations were developed on this basis.

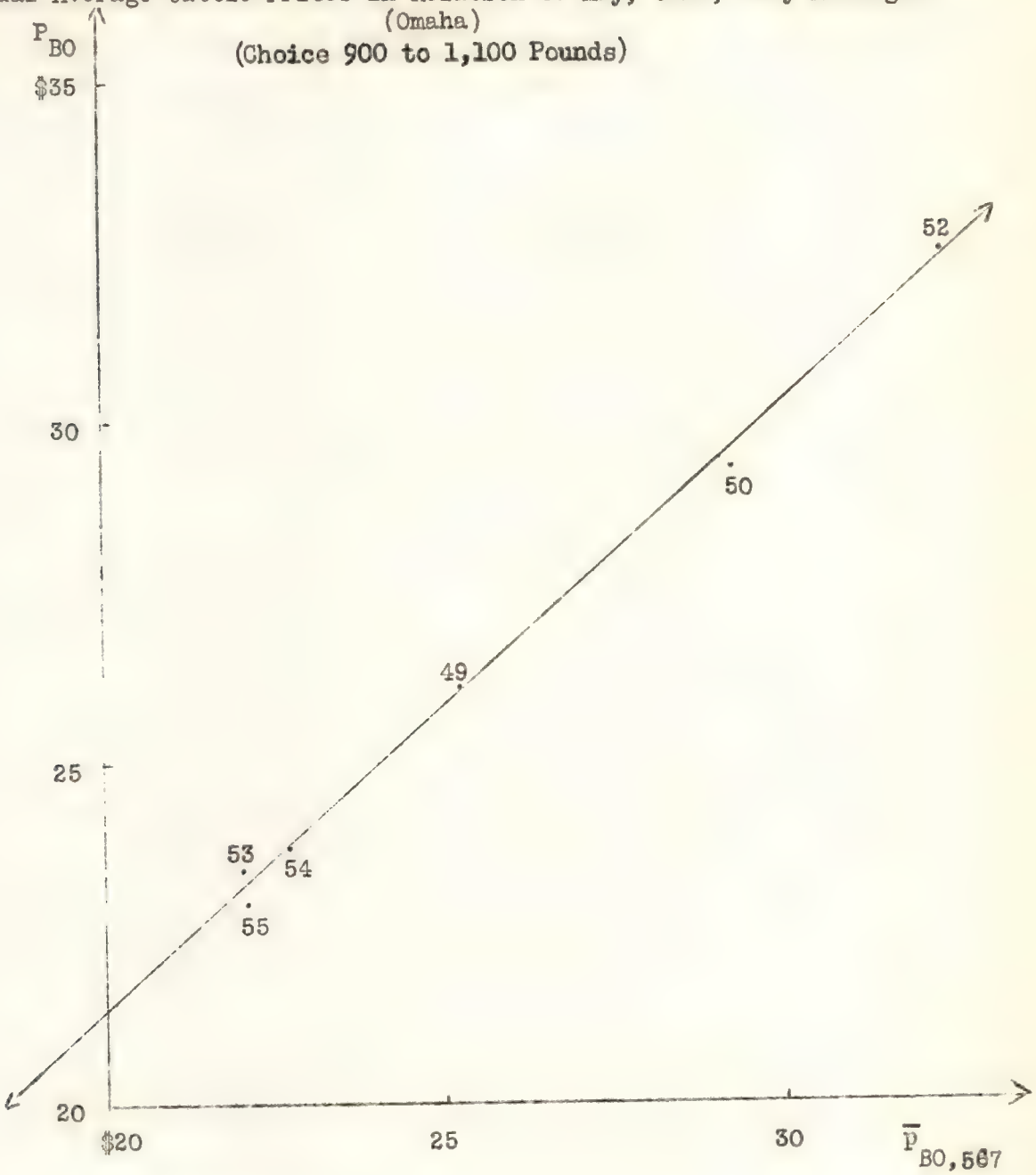
$$P_{BO}' = 3.435222 + .895437\ \bar{p}_{BO,567} \qquad \text{(Equation 9)}$$

$$P_{HO}' = -2.052763 + 1.010851\ p_{HO,567} \qquad \text{(Equation 10)}$$

Figures 11 and 12 illustrate these relationships.

FIGURE 11

Annual Average Cattle Prices in Relation to May, June, July Averages
(Omaha)
(Choice 900 to 1,100 Pounds)



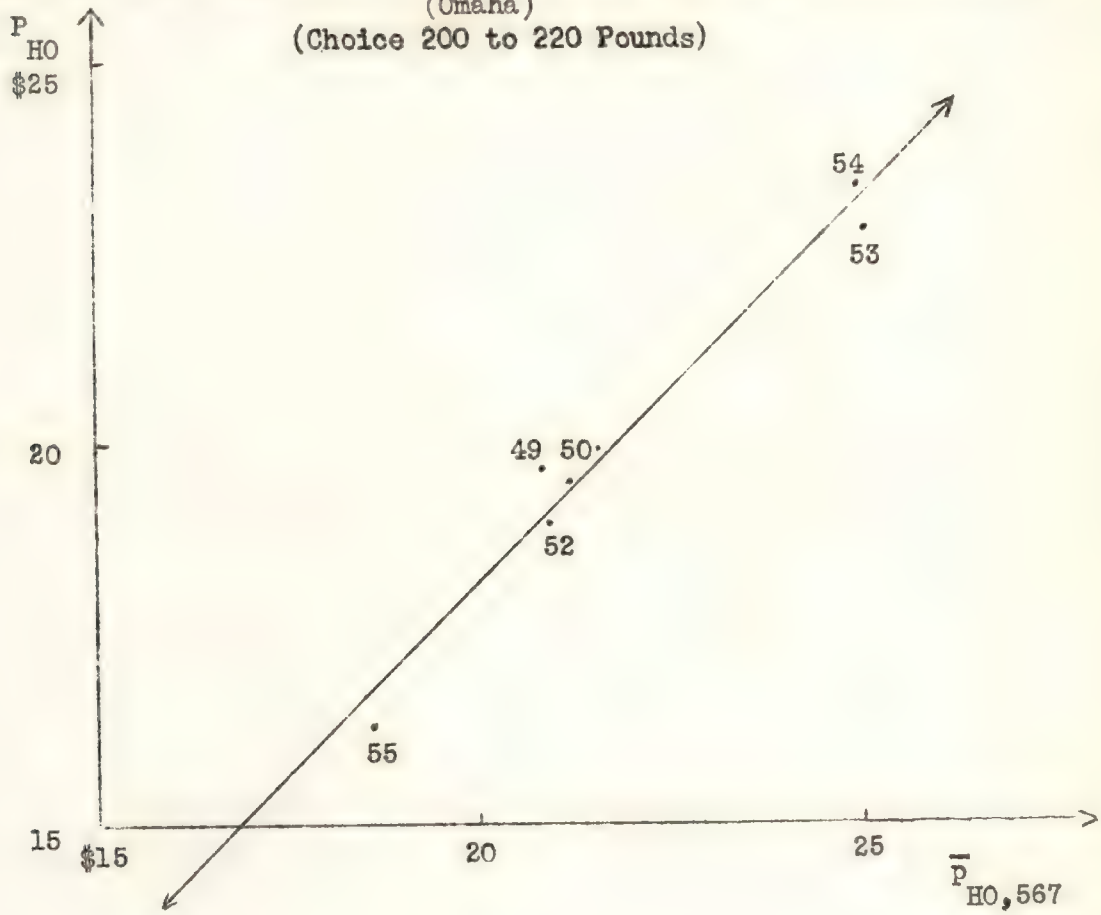

Equation 9

$$P'_{BO} = 3.435222 + .895437\bar{p}_{BO,567} \qquad r = .997389$$

| Data | $P_{BO}$ | $\bar{p}_{BO,567}$ |
|---|---|---|
| 1949 | 26.14 | 25.26 |
| 50 | 29.36 | 29.25 |
| 52 | 32.59 | 32.38 |
| 53 | 23.43 | 22.03 |
| 54 | 23.76 | 22.70 |
| 55 | 22.96 | 22.08 |

FIGURE 12

Annual Average Hog Prices in Relation to May, June, July Averages
(Omaha)
(Choice 200 to 220 Pounds)




Equation 10

$$P'_{HO} = -2.052763 + 1.010851\overline{P}_{HO,567} \qquad r = .986239$$

| Data | $P_{HO}$ | $\overline{P}_{HO,567}$ |
|---|---|---|
| 1949 | 19.65 | 20.81 |
| 50 | 19.49 | 21.17 |
| 52 | 18.96 | 20.91 |
| 53 | 22.82 | 25.06 |
| 54 | 23.37 | 24.93 |
| 55 | 16.29 | 18.59 |

B. The Annual Model and Its Quantification (Los Angeles Market)

1. Preliminary, Revised, and Final Forecasting (1) of $P_{BLA}$ and $P_{HLA}$

As indicated earlier, estimates of $P_{BLA}$ and $P_{HLA}$ should be directly related to estimates of $P_{BO}$ and $P_{HO}$. Logically, this relationship should be linear and should reflect transportation cost differentials from a marginal supply area. However, changes in transportation differentials are minor over short periods of time and the problem of forecasting their levels extremely difficult. Consequently, they were omitted since the evidence for their inclusion was not strong upon analysis. The average transportation cost differential is partly reflected in the constant terms of the following equations:

$$P'_{BLA} = 1.202413 + .951817P_{BO} \qquad \text{(Equation 11)}$$

$$P'_{HLA} = 3.575027 + .895089P_{HO} \qquad \text{(Equation 12)}$$

Figures 13 and 14 show these results. In application the relevant estimates for the Omaha market would be used in these equations.

2. Final Forecasting (2) of $P_{BLA}$ and $P_{HLA}$

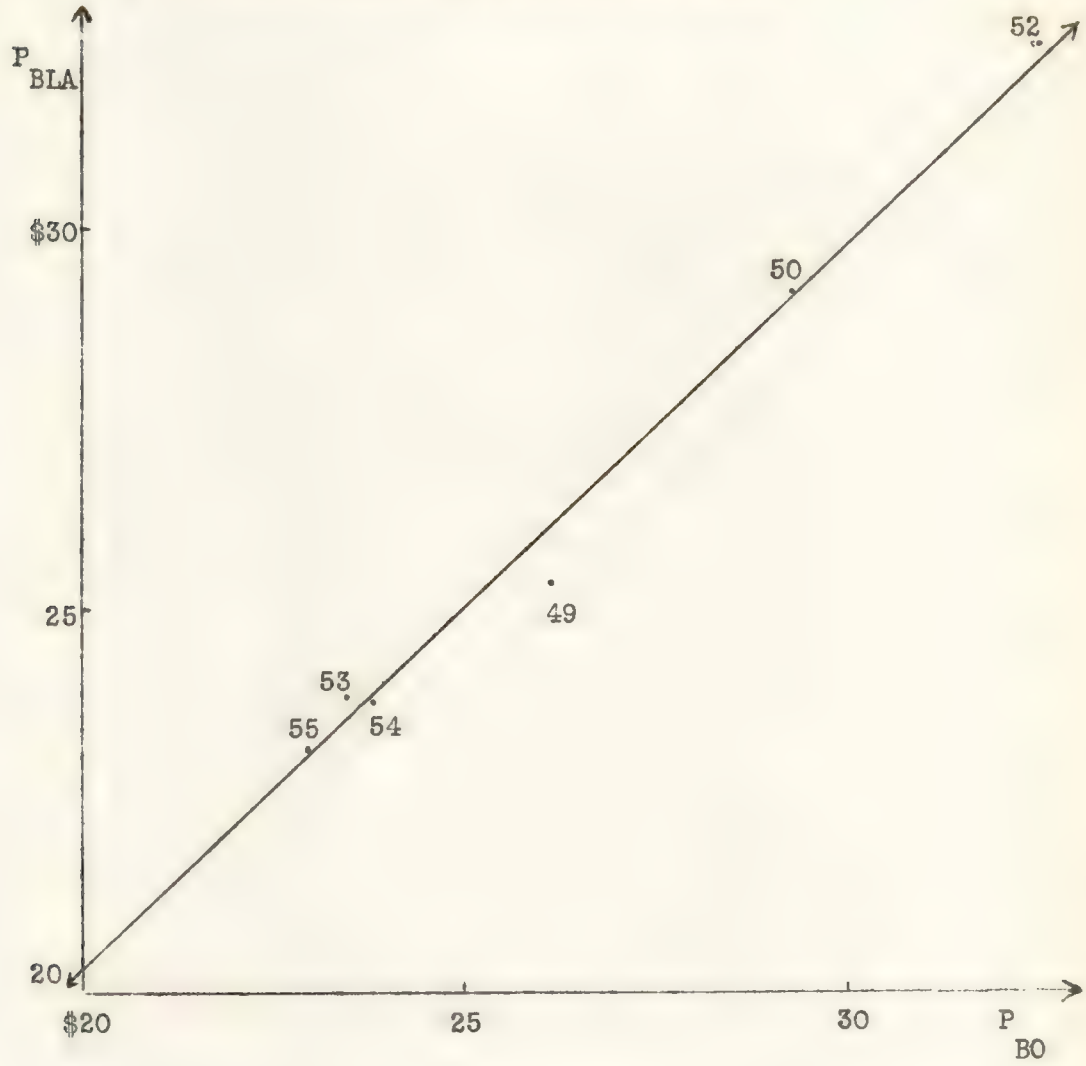
As for Omaha, it was found that the May through July average price levels were more accurate bases for estimating $P_{BLA}$ and $P_{HLA}$ than any of the alternate connections with the Omaha forecasts. These results are illustrated by Figures 15 and 16 and by the following equations:

$$P'_{BLA} = .205223 + .974054\bar{p}_{BLA,567} \qquad \text{(Equation 13)}$$

$$P'_{HLA} = -2.229674 + 1.024898\bar{p}_{HLA,567} \qquad \text{(Equation 14)}$$

FIGURE 13

Annual Average Prices for 900 to 1,100 Pound
Choice Steers, Los Angeles Vs. Omaha



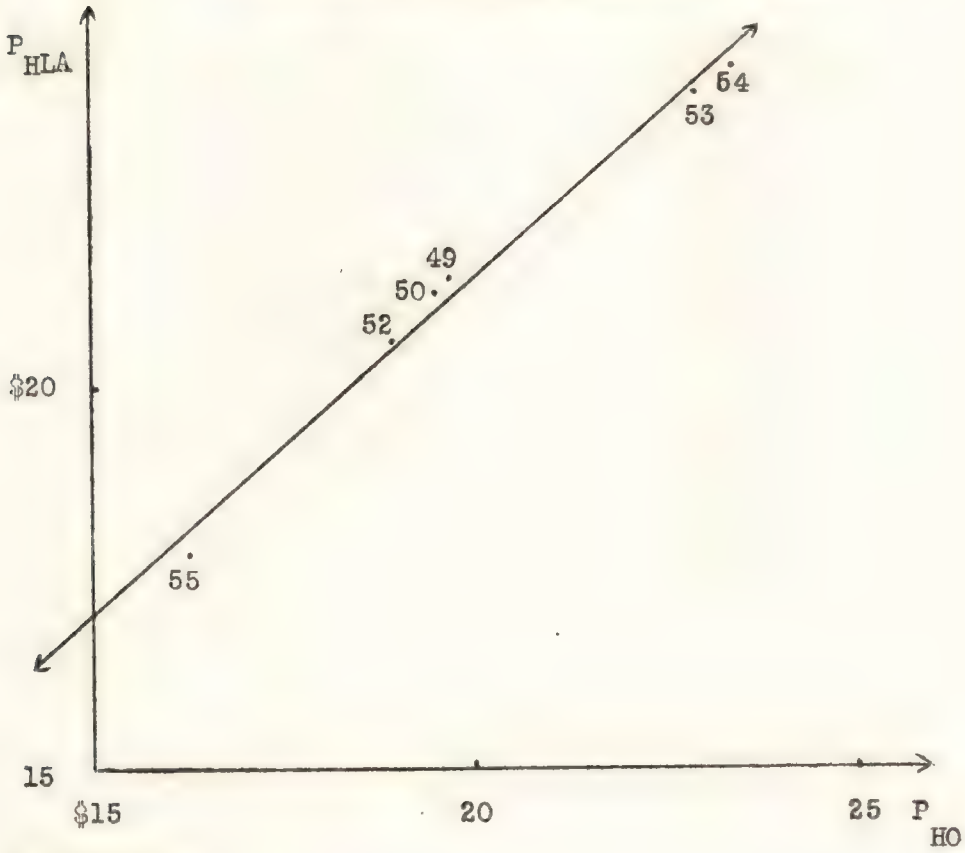

Equation 11

$P'_{BLA} = 1.202413 + .951817P_{BO}$ $\qquad r = .994914$

| Data | $P_{BLA}$ | $P_{BO}$ |
|---|---|---|
| 1949 | 25.38 | 26.14 |
| 50 | 29.14 | 29.36 |
| 52 | 32.44 | 32.59 |
| 53 | 23.88 | 23.43 |
| 54 | 23.83 | 23.76 |
| 55 | 23.16 | 22.96 |

FIGURE 14

Annual Average Prices for 200 to 220 Pound
Choice Hogs, Los Angeles Vs. Omaha




Equation 12

$P'_{HLA} = 3.575027 + .895089P_{HO}$ $\qquad$ $r = .994329$

| Data | $P_{HLA}$ | $P_{HO}$ |
|---|---|---|
| 1949 | 21.47 | 19.65 |
| 50 | 21.27 | 19.49 |
| 52 | 20.60 | 18.96 |
| 53 | 23.93 | 22.82 |
| 54 | 24.28 | 23.37 |
| 55 | 17.83 | 16.29 |

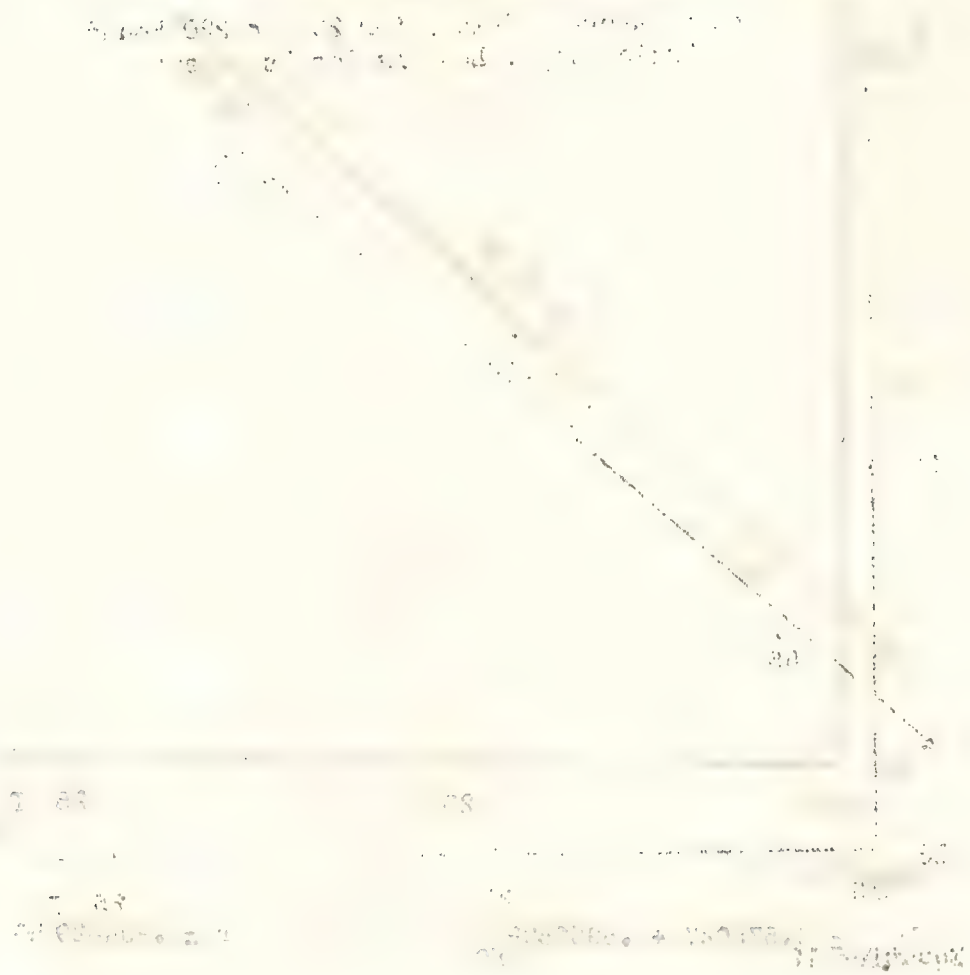
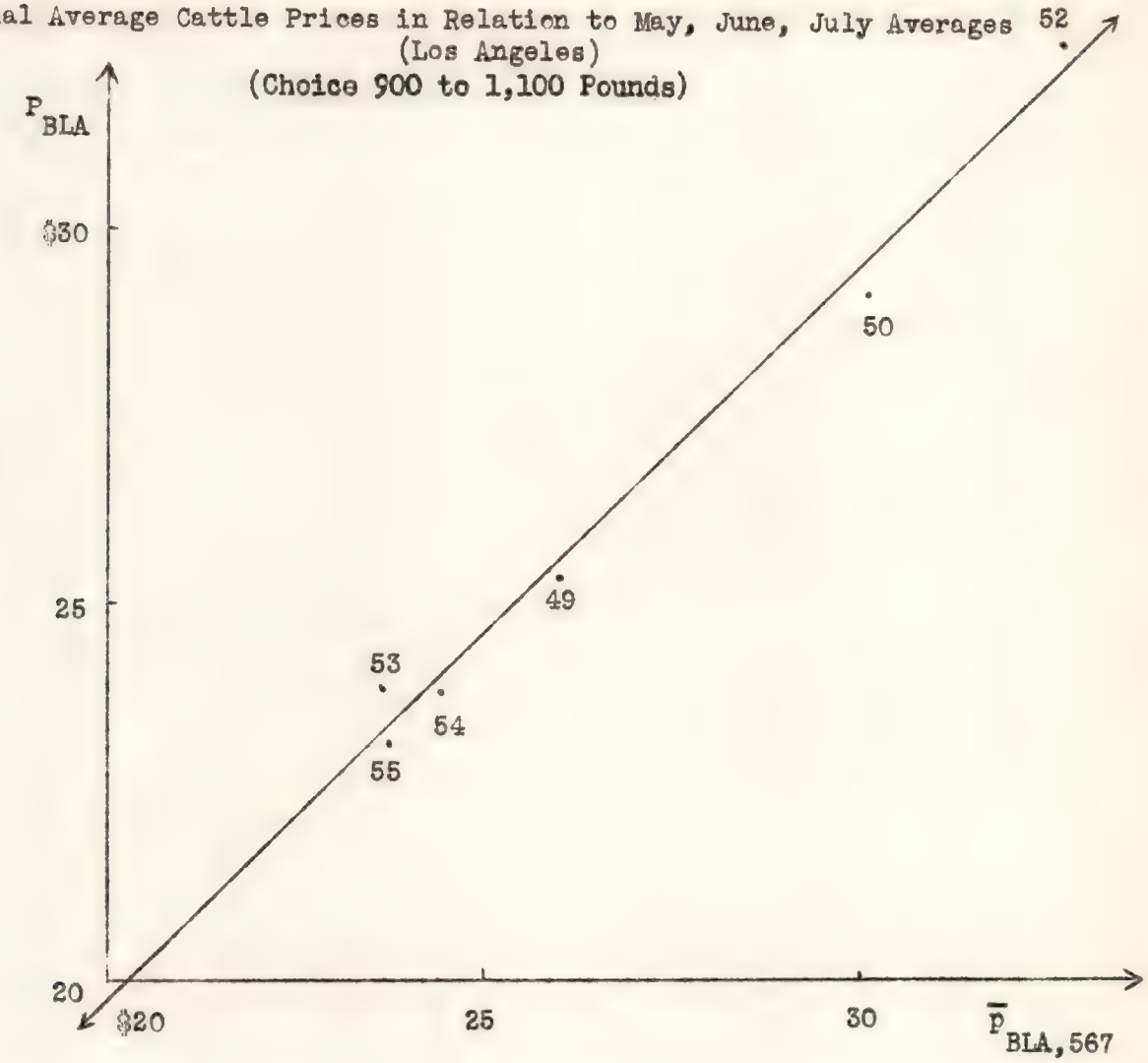


FIGURE 15

Annual Average Cattle Prices in Relation to May, June, July Averages
(Los Angeles)
(Choice 900 to 1,100 Pounds)



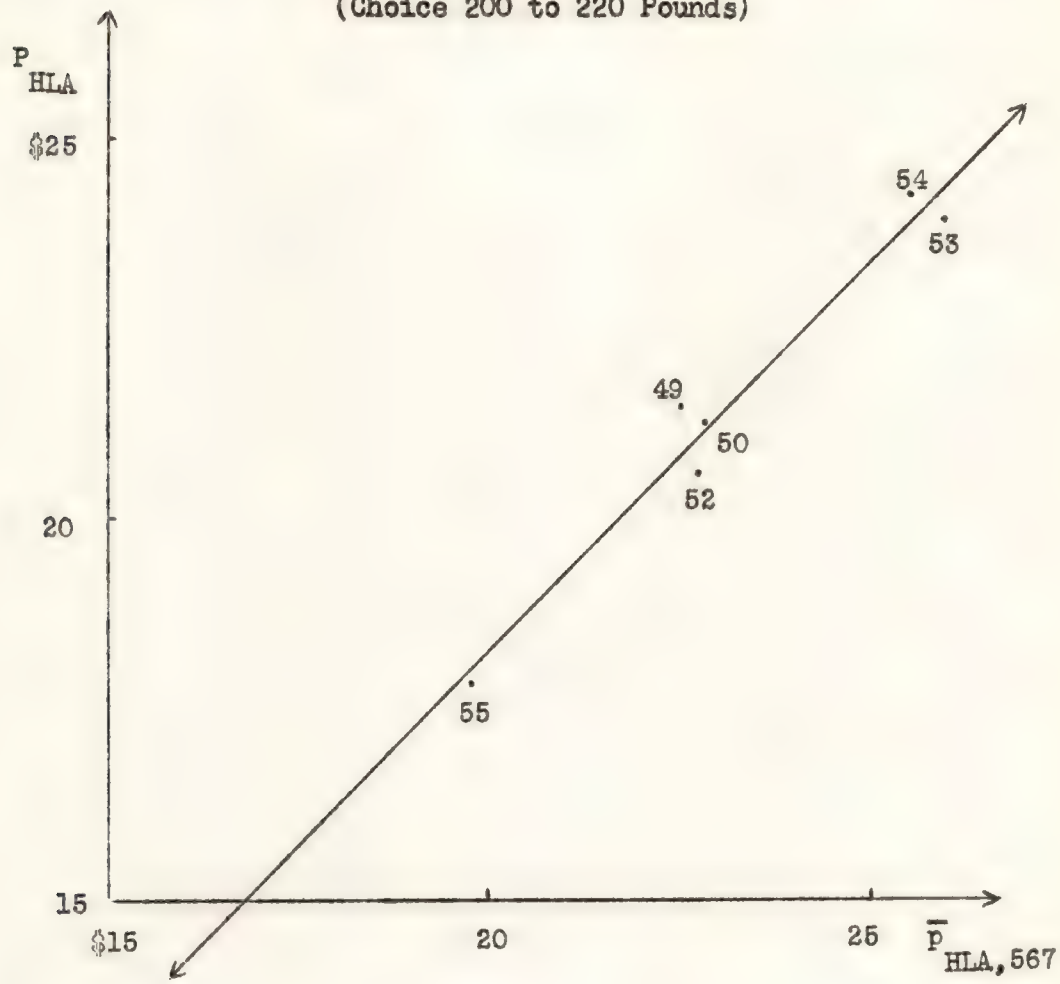

Equation 13

$$P'_{BLA} = .205223 + .974054\bar{p}_{BLA,567} \qquad r = .994139$$

| Data | $P_{BLA}$ | $\bar{p}_{BLA,567}$ |
|---|---|---|
| 1949 | 25.38 | 26.01 |
| 50 | 29.14 | 30.14 |
| 52 | 32.44 | 32.72 |
| 53 | 23.88 | 23.67 |
| 54 | 23.83 | 24.46 |
| 55 | 23.16 | 23.77 |

FIGURE 16

Annual Average Hog Prices in Relation to May, June, July Averages
(Los Angeles)
(Choice 200 to 220 Pounds)




Equation 14

$$P'_{HLA} = -2.229674 + 1.024898\bar{p}_{HLA,567} \qquad r = .981618$$

| Data | $P_{HLA}$ | $\bar{p}_{HLA,567}$ |
|---|---|---|
| 1949 | 21.47 | 22.50 |
| 50 | 21.27 | 22.82 |
| 52 | 20.60 | 22.74 |
| 53 | 23.93 | 25.96 |
| 54 | 24.28 | 25.51 |
| 55 | 17.83 | 19.76 |

## IV. The Annual Forecasts

### A. The Omaha Market

#### 1. Population Forecasts (Including Armed Forces Overseas)

Table 1 gives the population data and forecasts employed in the analysis. Columns 1 and 2 are, respectively, the preliminary and revised values reported by the Bureau of the Census. Column 3 is an estimated value based on a linesr intepolation between lagged values in column 2 and current values in column 1. Column 4 is self-explanatory and is the set of expansion ratios for estimating values in column 5. Values in column 5 are equal to the product of values found in a lagged row for columns 1 and 4. Relevant comparisons are between columns 1 and 2 and between columns 5 and 2. In both bases the absolute and relative deviations are extremely small.

#### 2. Beef and Veal Production Forecasts

Total beef and veal production forecasts (preliminary, revised, and final) are found in Table 2 as columns 3, 4, and 6. Column 7 gives the official revised values reported by the U. S. Department of Agriculture. Figure 17 gives a visual comparison of these values for the period 1949-1957.

Per-capita beef and veal production forecasts (preliminary, revised, and final) are found in Table 2 as columns 8, 9, and 10. Column 11 gives the computed values using official revised data reported by the U. S. Department of Agriculture and the Bureau of the Census. Figure 18 gives these results in graphic form.

#### 3. Pig Crops and Pork Production Forecasts

The preliminary, revised, and final forecasts of total spring pigs saved are given in columns 10, 11, and 5 of Table 3. Column 8 of Table 3

3. Population Forecasts (Including Armed Forces Overseas)

Table I gives the population data and forecasts employed in the analysis. Columns 1 and 2 are, respectively, the preliminary and current values reported by the Bureau of the Census. Column 3 is an estimated value based on a linear interpolation between lagged values in column 2 and current values in column 1. Column 4 is self-explanatory and is the set of conversion ratios for estimating values in column 5. Values in column 5 are equal to the product of values found in a lagged row in columns 1 and 4. Relevant comparisons are between columns 1 and 3 and between columns 5 and 2. In both cases the absolute and relative deviations are extremely small.

4. Beef and Veal Production Forecasts

Total beef and veal production forecasts (preliminary, revised, and final) are found in Table 2 as columns 3, 4, and 5. Column 7 gives the official revised values reported by the U. S. Department of Agriculture. Figure 17 gives a visual comparison of these values for the period 1960-1977.

Pork-equivalent beef and veal production forecasts (preliminary, revised, and final) are found in Table 2 as columns 6, 9, and 10. Column 11 gives the computed values using official revised data reported by the U. S. Department of Agriculture and the Bureau of the Census. Figure 18 gives these results in graphic form.

5. Pig Crops and Pork Production Forecasts

The preliminary, revised, and final forecasts of total spring pigs saved are given in columns 10, 11, and 5 of Table 3. Column 8 of table 3

TABLE 1

Data on United States Population (Including Armed Forces Overseas)

| Year | Preliminary July 1 a/ | Revised July 1 | Estimated May 15 b/ | Preliminary$_i$ divided by revised$_{i-1}$ | Estimated July 1 c/ |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| | $10^6$ persons | | | ratio | $10^6$ persons |
| 1947 | 144.239 | 144.126 | d/ | | |
| 1948 | 146.571 | 146.631 | 146.265 | 1.0170 | |
| 1949 | 149.215 | 149.188 | 148.892 | 1.0176 | 149.063 |
| 1950 | 151.772 | 151.683 | 151.449 | 1.0173 | 151.841 |
| 1951 | 154.353 | 154.360 | 154.019 | 1.0176 | 154.398 |
| 1952 | 157.015 | 157.028 | 156.683 | 1.0172 | 157.070 |
| 1953 | 159.696 | 159.643 | 159.362 | 1.0170 | 159.716 |
| 1954 | 162.414 | 162.409 | 162.068 | 1.0174 | 162.411 |
| 1955 | 165.248 | 165.248 | 164.893 | 1.0175 | 165.240 |
| 1956 | 168.091 | | 167.736 | 1.0172 | 168.140 |
| 1957 | | | | | 170.982 |

a/ Use as final estimate in August for estimating per-capita beef plus veal and pork (final in August).

b/ Use to compute final estimate of per-capita disposable personal income in Table 4, column 2.

c/ Use in making preliminary estimates of per-capita beef plus veal and pork (preliminary in August). Use in making revised estimates of per-capita beef plus veal and pork (revised in February).

d/ Blank spaces indicate no data available or data not relevant to analysis.

Table 1

Data on United States Population (Including Armed Forces Overseas)

| Date | Population [illegible] | Population [illegible] | Population [illegible] | Population [illegible] divided by revised [illegible] | Percentage [illegible] |
|---|---|---|---|---|---|
| | Thousands | | | | |
| | | | Indexes | | |
| [illegible] | 144.229 | 144.126 | [illegible] | | |
| [illegible] | [illegible] | [illegible] | [illegible] | | |
| [illegible] | 149.215 | 149.158 | 148.892 | 1.0176 | 149.063 |
| [illegible] | 151.772 | 151.693 | 151.440 | 1.0173 | 151.384 |
| [illegible] | [illegible] | [illegible] | [illegible] | | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | | [illegible] |
| [illegible] | 159.096 | 159.013 | 158.762 | 1.0170 | 159.716 |
| [illegible] | 162.414 | 162.309 | 162.068 | 1.0174 | 162.414 |
| [illegible] | 165.284 | 165.218 | 164.893 | 1.0175 | 165.280 |
| [illegible] | 168.091 | | 167.736 | 1.0172 | 168.140 |
| [illegible] | | | | | |

a/ Use as final estimate in August for estimating per-capita beef plus veal and pork (final in August).

b/ Use to compute final estimate of per-capita disposable personal income in Table 4, column 2.

c/ Use in making preliminary estimates of per-capita beef plus veal and pork (preliminary in August). Use in making revised estimates of per-capita beef plus veal and pork (revised in February).

d/ Blank spaces indicate no data available or data not relevant to computation.

FIGURE 17

Total Beef and Veal Production ($10^9$ Pounds)

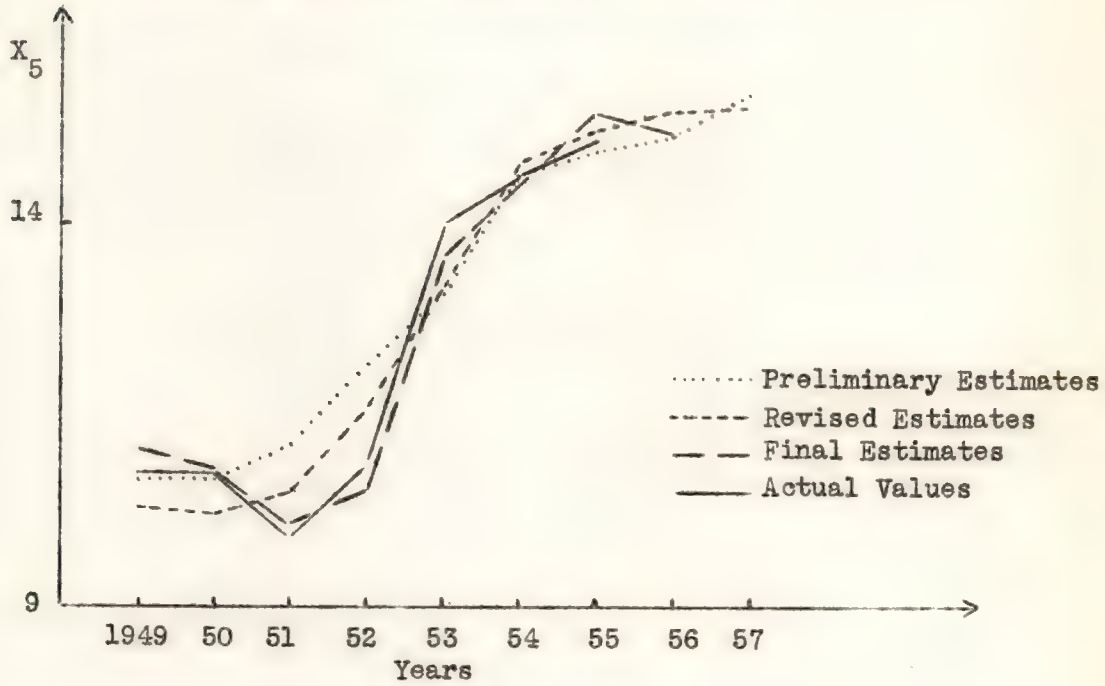



FIGURE 18

Per-Capita Beef and Veal Production (Pounds)

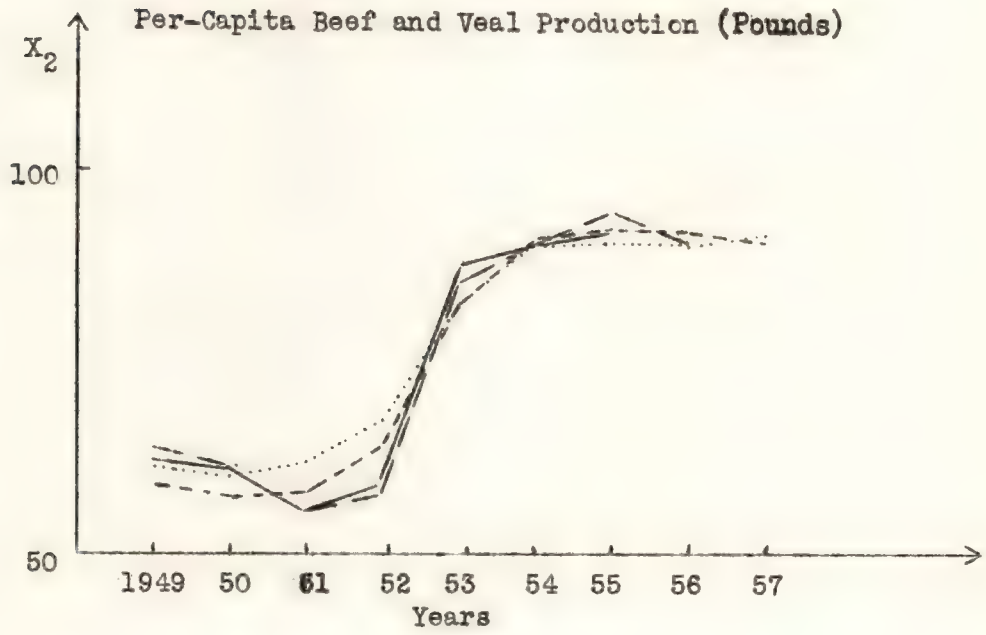


TABLE 2

Making Forecasts of Total and Per-Capita Beef and Veal Production

| Year | Preliminary January 1 cattle and calves | Revised January 1 cattle and calves | Preliminary estimate of total beef and veal[a] | Revised estimate of total beef and veal[b] | Total federally inspected slaughter January through June | Final estimate of total beef and veal[c] | Revised total beef and veal | Preliminary estimate of per-capita beef and veal production[d] | Revised estimate of per-capita beef and veal production[e] | Final estimate of per-capita beef and veal production[f] | Actual per-capita beef and veal production[g] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| | $10^6$ animals | | $10^9$ pounds | | | | | pounds per capita | | | |
| 1947 | 81.050 | 80.554 | —[h] | -- | -- | -- | -- | -- | -- | -- | -- |
| 1948 | 78.564 | 77.171 | 11.319 | 11.186 | — | -- | -- | -- | -- | -- | -- |
| 1949 | 78.495 | 76.830 | 10.654 | 10.281 | 3.772 | 11.044 | 10.773 | 71.5 | 69.0 | 74.0 | 72.2 |
| 1950 | 80.277 | 77.963 | 10.635 | 10.189 | 3.684 | 10.812 | 10.768 | 70.0 | 67.1 | 71.2 | 71.0 |
| 1951 | 84.179 | 82.083 | 11.112 | 10.493 | 3.408 | 10.086 | 9.904 | 72.0 | 68.0 | 65.3 | 65.3 |
| 1952 | 88.062 | 88.072 | 12.157 | 11.596 | 3.567 | 10.504 | 10.840 | 77.4 | 73.8 | 66.9 | 69.0 |
| 1953 | 93.696 | 94.241 | 13.197 | 13.199 | 4.755 | 13.631 | 13.989 | 82.6 | 82.6 | 85.4 | 87.6 |
| 1954 | 94.677 | 95.679 | 14.705 | 14.851 | 5.116 | 14.580 | 14.647 | 90.5 | 91.4 | 89.8 | 90.2 |
| 1955 | 95.433 | 96.592 | 14.968 | 15.236 | 5.456 | 15.475 | 15.212 | 90.6 | 92.2 | 93.6 | 92.1 |
| 1956 | 97.465 | 96.804 | 15.170 | 15.481 | 5.350 | 15.196 | | 90.2 | 92.1 | 90.4 | |
| 1957 | 95.166 | | 15.714 | 15.537 | | | | 91.9 | 90.9 | | |
| 1958 | [i] | | 15.099 | | | | | | | | |

a/ Use lagged value in column 1 in equation 3.
b/ Use lagged value in column 2 in equation 3.
c/ Use value in column 5 in equation 4.
d/ Equal to column 3, Table 2 divided by column 5, Table 1.
e/ Equal to column 4, Table 2 divided by column 5, Table 1.
f/ Equal to column 6, Table 2 divided by column 1, Table 1.
g/ Equal to column 7, Table 2 divided by column 2, Table 1.
h/ Dashes indicate values omitted because they are not relevant to the analysis.
i/ Blank spaces indicate data not available.

| Year | Preliminary estimate | Revised estimate | Preliminary estimate | Revised estimate | [illegible] | [illegible] | Preliminary estimate of per-capita consumption | Revised estimate of per-capita consumption | Final estimate of per-capita consumption | [illegible] |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1/ million | | | | 2/ per cent | | | | | |
| 1947 | 81.056 | 80.756 | — | — | — | — | — | — | — | — |
| 1948 | 76.504 | 74.171 | 11.320 | 11.170 | — | — | — | — | — | — |
| 1949 | 76.495 | 75.050 | 10.694 | 10.631 | 3.772 | 11.045 | 10.775 | 75.5 | 65.0 | 74.0 |
| 1950 | 80.277 | 77.085 | 10.865 | 10.128 | 3.[illegible] | 10.[illegible] | 10.766 | 75.0 | 67.1 | 71.2 |
| 1951 | 84.175 | 82.065 | 11.112 | 10.695 | 3.[illegible] | 10.[illegible] | 9.[illegible] | 72.0 | 67.0 | 65.5 |
| 1952 | 86.086 | 87.074 | 11.[illegible] | 11.[illegible] | [illegible] | [illegible] | [illegible] | 77.1 | [illegible] | [illegible] |
| 1953 | 92.698 | 94.241 | 13.127 | 13.149 | 4.175 | 13.[illegible] | 1.[illegible] | 82.8 | 68.6 | 83.4 |
| 1954 | 97.277 | 98.070 | 13.[illegible] | 13.[illegible] | [illegible] | 13.[illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 1955 | 98.458 | 96.592 | 14.052 | 15.276 | 4.459 | 13.[illegible] | 14.[illegible] | 90.0 | 69.2 | [illegible] |
| 1956 | 97.464 | 96.464 | 17.170 | 17.241 | 4.[illegible] | 13.[illegible] | | [illegible] | 69.1 | 90.4 |
| 1957 | 97.105 | | 15.714 | 17.[illegible] | | | | [illegible] | 70.0 | |
| 1958 | | | 15.095 | | | | | | | |

1/ Has lagged value in column 1 in equation 3.
2/ Has lagged value in column 2 in equation 3.
3/ Has value in column 3 in equation 4.
4/ Equal to column 4, Table 2 divided by column 5, Table 1.
5/ Equal to column 6, Table 2 divided by column 5, Table 1.
6/ Equal to column 8, Table 2 divided by column 7, Table 1.
7/ Equal to column 7, Table 2 divided by column 5, Table 1.
Source: Bureau of Agricultural Economics.
Column headed "Actual" from Statistical Bulletin 68, Table 2.

TABLE 3

Making Forecasts of Total Spring and Fall Pig Crops

| Year | May-July hog/corn price ratio (Chicago basis) | Estimated annual average hog/corn price ratio | Actual annual average hog/corn price ratio | Preliminary spring pigs saved | Adjusted preliminary spring pigs saved a/ | Preliminary fall pigs saved | Adjusted preliminary fall pigs saved b/ | Revised spring pigs saved | Revised fall pigs saved | Preliminary estimate of spring pigs saved c/ | Revised estimate of spring pigs saved d/ | Preliminary estimate of fall pigs saved e/ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| | | | | $10^6$ animals | | | | | | | | |
| 1947 | 11.7 | 13.3 | 12.9 | 53.151 | 51.299 | 31.352 | 30.173 | 52.199 | 31.090 | f/ | | 32.448 |
| 1948 | 10.7 | 12.1 | 12.5 | 51.421 | 49.702 | 33.995 | 32.748 | 50.468 | 33.358 | 53.606 | 49.102 | 31.244 |
| 1949 | 14.8 | 14.0 | 14.7 | 59.040 | 56.736 | 37.262 | 35.934 | 56.969 | 36.275 | 50.212 | 52.893 | 36.545 |
| 1950 | 13.7 | 12.9 | 12.9 | 60.079 | 57.695 | 40.657 | 39.240 | 57.958 | 39.423 | 58.529 | 59.011 | 37.268 |
| 1951 | 12.6 | 11.9 | 11.8 | 63.818 | 61.147 | 40.182 | 38.777 | 61.298 | 39.288 | 56.882 | 59.599 | 39.870 |
| 1952 | 11.4 | 10.8 | 10.7 | 56.607 | 54.490 | 35.355 | 34.073 | 55.135 | 33.694 | 57.257 | 55.507 | 34.853 |
| 1953 | 16.0 | 15.1 | 14.6 | 50.726 | 49.060 | 31.882 | 30.689 | 47.940 | 29.974 | 50.712 | 49.195 | 30.760 |
| 1954 | 15.1 | 14.3 | 14.5 | 56.066 | 53.990 | 36.766 | 35.448 | 52.852 | 33.978 | 55.784 | 54.170 | 34.476 |
| 1955 | 12.3 | 11.6 | 11.4 | 60.453 | 58.041 | 37.914 | 36.567 | 57.690 | 38.029 | 57.301 | 59.898 | 37.529 |
| 1956 | 10.8 | 10.2 | 10.7 | 53.085 | 51.238 | 36.535 | 35.223 | 53.136 | | 54.578 | 52.925 | 32.402 |
| 1957 | | | | | | | | | | 47.327 | 51.612 | |

a/ Based on values in column 4, Table 3, adjusted by method indicated on page 21 of text.
b/ Based on values in column 4, Table 3, adjusted by method indicated on page 21 of text.
c/ Based on lagged values in columns 2, 5, and 12, Table 3, used in equation 6.
d/ Based on lagged values in columns 3, 7, and 8, Table 3, used in equation 6.
e/ Based on values in column 5, Table 3, used in equation 5.
f/ Blank spaces indicate no data available or data not relevant to analysis.

gives the revised official values reported by the U. S. Department of Agriculture. These values are portrayed on Figure 19. The final forecasts are omitted since they are merely adjusted preliminary values reported by the U. S. Department of Agriculture.

The preliminary and final forecasts of total fall pigs saved are given in columns 12 and 7 of Table 3. Column 9 represents the revised official values reported by the U. S. Department of Agriculture. Figure 20 shows the results in graphic form. The final forecasts are adjusted preliminary values reported by the U. S. Department of Agriculture and are omitted.

Columns 2, 3, and 4 of Table 4 give the preliminary, revised, and final forecasts of total pork production. Column 5 gives the revised official estimates of the U. S. Department of Agriculture. These values are presented on Figure 21.

The preliminary, revised, and final forecasts of per-capita pork production are found in columns 6, 7, and 8 of Table 4. Column 9 gives the values computed from official revised production data of the U. S. Department of Agriculture and population figures of the Bureau of the Census. These values are presented on Figure 22.

4. Per-Capita Disposable Income Forecasts

Preliminary and final forecasts of United States annual per-capita disposable income are found in columns 2 and 4 of Table 5. Official Department of Commerce figures are given in column 1. Figure 23 presents these results.

5. Forecasts of $X_1$ and $X_1^*$

Table 6 gives these results and is self-explanatory. These estimates are computed by using forecasts of $X_2$, $X_3$, and $X_4$ in equations 1 and 2.

FIGURE 19

Spring Pigs Saved ($10^6$)

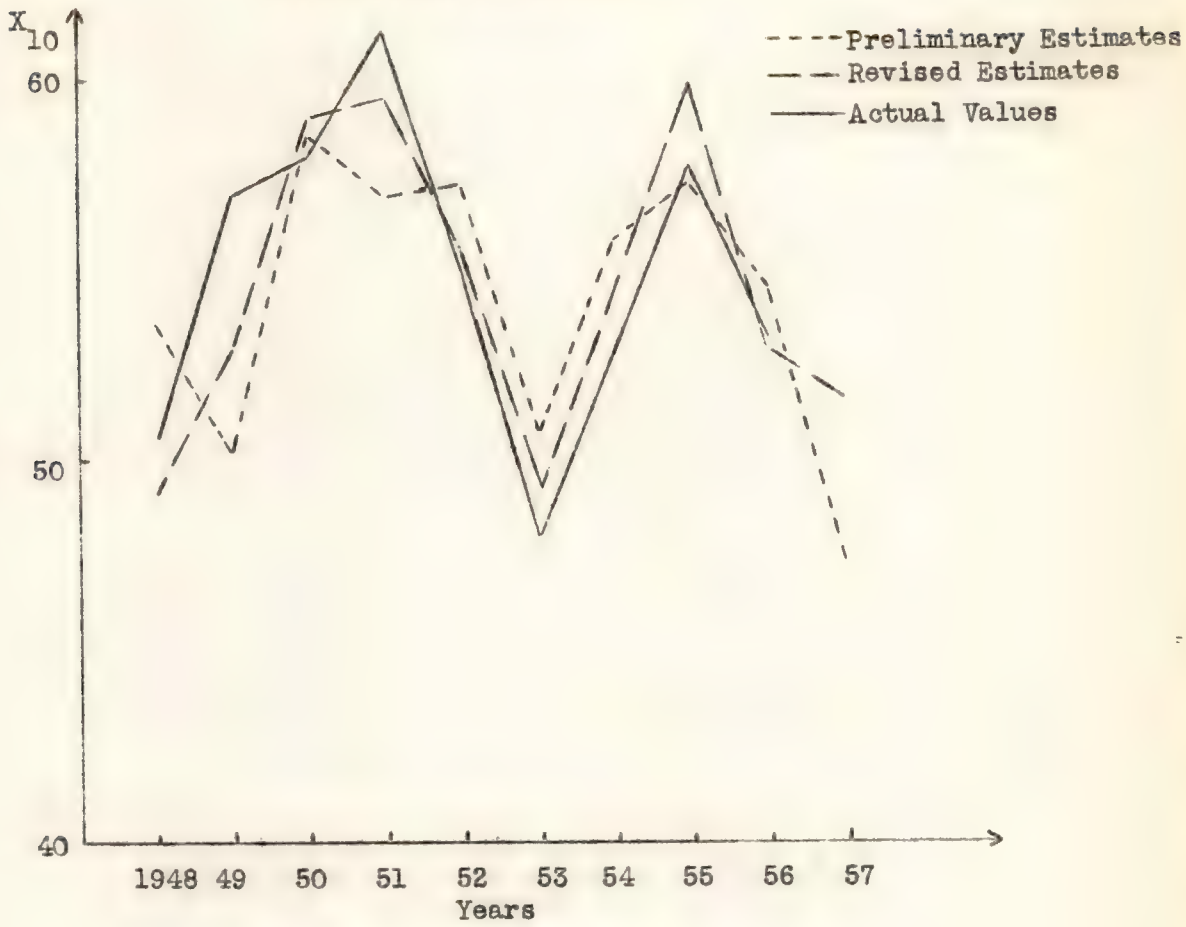



FIGURE 20

Fall Pigs Saved ($10^6$)

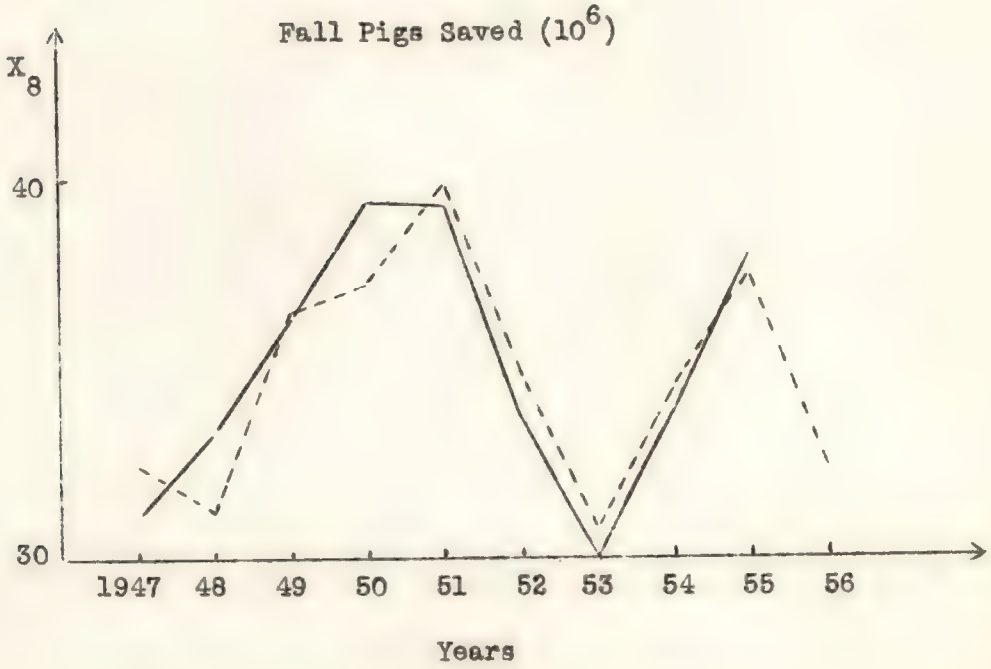


TABLE 4

Making Forecasts of Total and Per-Capita Pork Production

| Year | January-June federally inspected slaughter | Preliminary estimate of total pork production a/ | Revised estimate of total pork production b/ | Final estimate of total pork production c/ | Revised total pork production | Preliminary estimate of per-capita pork production d/ | Revised estimate of per-capita pork production e/ | Final estimate of per-capita pork production f/ | Actual per-capita pork production g/ |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | $10^9$ pounds | | | | | pounds | | | |
| 1947 | 3.506 | | | 10.123 | 10.502 | h/ | | 70.2 | 72.9 |
| 1948 | 3.422 | 10.372 | 9.900 | 9.968 | 10.055 | | | 68.0 | 68.6 |
| 1949 | 3.522 | 10.033 | 10.337 | 10.153 | 10.286 | 67.3 | 69.3 | 68.0 | 68.9 |
| 1950 | 3.796 | 11.102 | 11.088 | 10.661 | 10.714 | 73.1 | 73.0 | 70.2 | 70.6 |
| 1951 | 4.161 | 11.070 | 11.406 | 11.337 | 11.483 | 71.7 | 73.9 | 73.4 | 74.4 |
| 1952 | 4.341 | 11.357 | 11.160 | 11.671 | 11.547 | 72.3 | 71.1 | 74.3 | 73.5 |
| 1953 | 3.699 | 10.430 | 10.281 | 10.481 | 10.063 | 65.3 | 64.4 | 65.6 | 63.0 |
| 1954 | 3.404 | 10.340 | 10.213 | 9.934 | 9.952 | 63.7 | 62.9 | 61.2 | 61.3 |
| 1955 | 3.884 | 10.814 | 11.040 | 10.824 | 11.016 | 65.4 | 66.8 | 65.5 | 66.7 |
| 1956 | 4.455 | 10.949 | 10.760 | 11.882 | | 65.1 | 64.0 | 70.7 | |
| 1957 | | 9.965 | 10.496 | | | 58.3 | 61.4 | | |

a/ Based on 80 per cent of values in column 10, Table 3, plus 20 per cent of lagged values in column 5, Table 3, plus lagged values in column 12, Table 3, used in equation 7.
b/ Based on 80 per cent of values in column 11, Table 3, plus 20 per cent of lagged values in column 8, Table 3, plus lagged values in column 7, Table 3, used in equation 7.
c/ Based on values in column 1, Table 4, used in equation 8.
d/ Column 2, Table 4, divided by column 5, Table 1.
e/ Column 3, Table 4, divided by column 5, Table 1.
f/ Column 4, Table 4, divided by column 1, Table 1.
g/ Column 5, Table 4, divided by column 2, Table 1.
h/ Blank spaces indicate no data available or data not relevant to analysis.

FIGURE 21

Total Pork Production ($10^9$ Pounds)

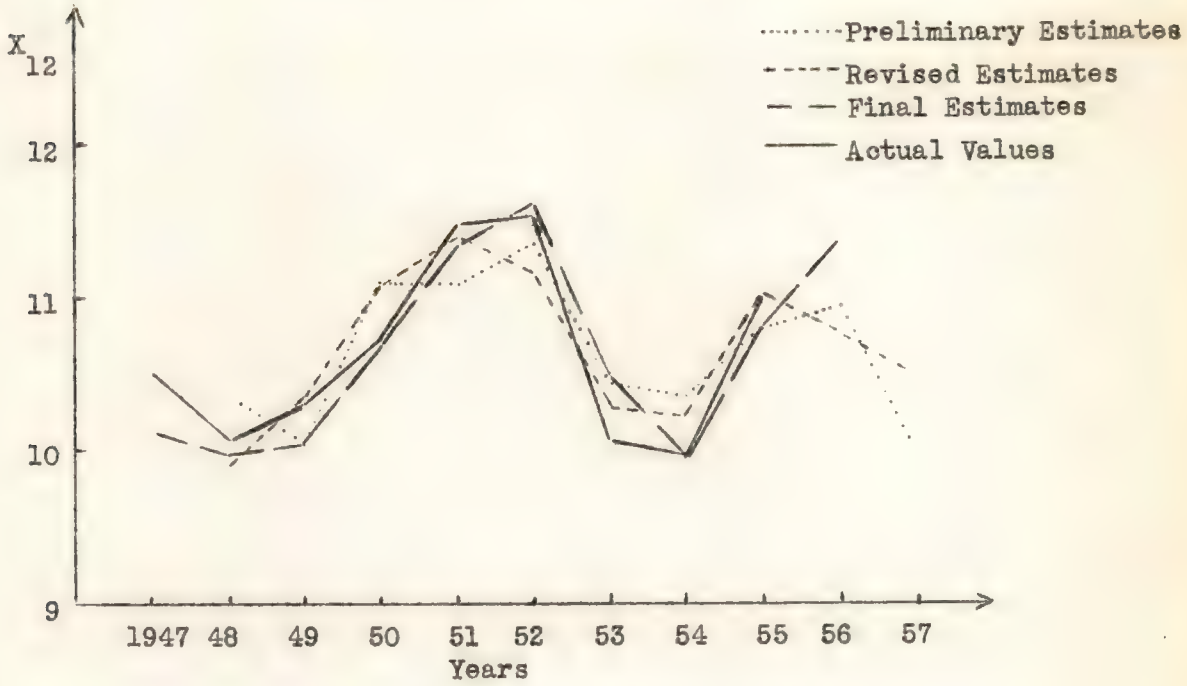



FIGURE 22

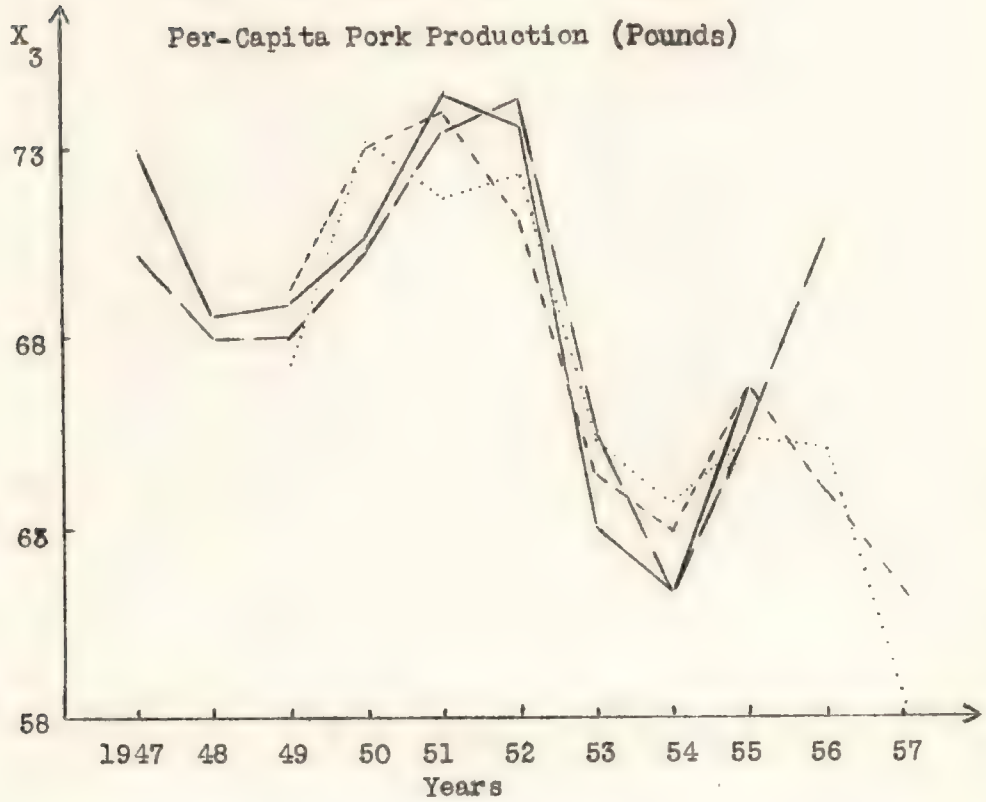


TABLE 5

Data on Disposable Personal Income (Annual Rates)

| Year | Revised per-capita disposable income | Preliminary estimate of per-capita disposable income[a] | Preliminary total United States disposable income, second quarter | Final estimate of per-capita disposable income[b] |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| | dollars | | $10^9$ dollars | dollars |
| 1947 | [c] | | 170.0 | |
| 1948 | 1,279 | 1,279 | 187.3 | 1,281 |
| 1949 | 1,261 | 1,324 | 194.2 | 1,304 |
| 1950 | 1,359 | 1,370 | 195.5 | 1,291 |
| 1951 | 1,465 | 1,418 | 222.8 | 1,447 |
| 1952 | 1,508 | 1,468 | 231.5 | 1,478 |
| 1953 | 1,568 | 1,519 | 247.7 | 1,554 |
| 1954 | 1,569 | 1,572 | 252.9 | 1,560 |
| 1955 | 1,628 | 1,627 | 267.1 | 1,620 |
| 1956 | 1,706[d] | 1,684 | 284.9 | 1,699 |
| 1957 | | 1,743 | | |

a/ Use in August for making preliminary estimates. Use in February for making revised estimates. Values are based on 3.5 per cent annual increase with 1948 as a base.

b/ Use in making final estimates. Values are equal to column 3, Table 5, divided by column 3, Table 1.

c/ Blank spaces indicate no data available or data not relevant to analysis.

d/ Preliminary.

FIGURE 23

Per-Capita Annual Disposable Income (United States)

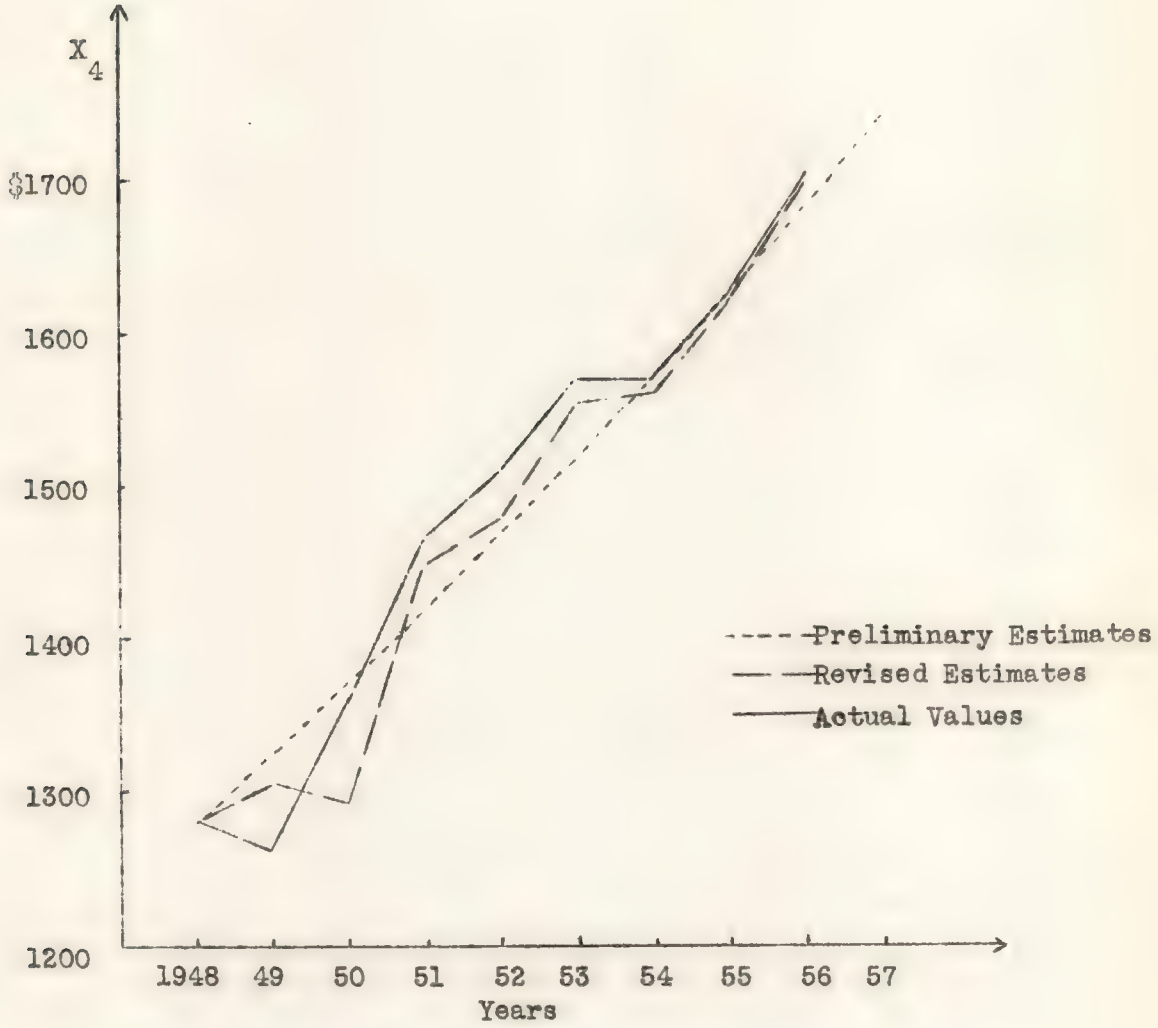


TABLE 6

Forecasts and Actual Values for $X_1$ and $X_1^*$ (Omaha)

| Year | Actual values | | Preliminary estimates | | Revised estimates | | Final estimates | |
|---|---|---|---|---|---|---|---|---|
| | $X_1$ | $X_1^*$ | $X_1'$ | $X_1^{*\prime}$ | $X_1'$ | $X_1^{*\prime}$ | $X_1'$ | $X_1^{*\prime}$ |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | dollars | ratio | dollars | ratio | dollars | ratio | dollars | ratio |
| 1949 | 32.60 | 1.330 | 35.47 | 1.231 | 35.37 | 1.363 | 33.39 | 1.299 |
| 1950 | 34.57 | 1.506 | 33.32 | 1.668 | 34.79 | 1.638 | 33.04 | 1.441 |
| 1951 | 38.66 | 1.680 | 34.24 | 1.588 | 34.74 | 1.724 | 36.97 | 1.671 |
| 1952 | 36.29 | 1.719 | 32.22 | 1.685 | 34.77 | 1.567 | 36.22 | 1.758 |
| 1953 | 34.83 | 1.027 | 35.33 | 1.206 | 35.92 | 1.138 | 34.48 | 1.257 |
| 1954 | 35.76 | 1.017 | 33.61 | 1.156 | 33.70 | 1.103 | 35.35 | .959 |
| 1955 | 32.01 | 1.409 | 33.56 | 1.297 | 31.86 | 1.416 | 31.89 | 1.326 |
| 1956 | a/ | | 35.10 | 1.284 | 34.90 | 1.215 | 31.63 | 1.712 |
| 1957 | | | 39.94 (37.31)b/ | .794 (1.097)b/ | 38.39 (36.93)c/ | 1.021 (1.080)c/ | | |

a/ Blank spaces indicate no data available or data not relevant to analysis.

b/ Corrected. See columns 3 and 4, Table 7.

c/ Corrected. See columns 5 and 6, Table 7.

6. Forecasts of $P_{BO}$ and $P_{HO}$

Preliminary, revised, and final forecasts (1) of $P_{BO}$ and $P_{HO}$ are given in Table 7 and graphically on Figures 24 and 25. These estimates are all based on equations 1 and 2.

Final forecasts (2) of $P_{BO}$ and $P_{HO}$ are found in the last two columns of Table 7 and are presented for visual appraisal on Figures 26 and 27. These results are based on equations 9 and 10.

B. The Los Angeles Market

1. Forecasts of $P_{BLA}$ and $P_{HLA}$

The preliminary, revised, and final forecasts (1) of $P_{BLA}$ and $P_{HLA}$ are given in Table 8. These estimates are based on the use of equations 11 and 12 which connect the Omaha and Los Angeles markets. Figures 28 and 29 present these results.

Final forecasts (2) of $P_{BLA}$ and $P_{HLA}$ are given in the last two columns of Table 8. They are based on equations 13 and 14 and are presented on Figures 30 and 31.

[illegible] Formulas for $\xi_{ij}$ and $\xi_{ij}$

Preliminary, residual, and final forecasts (2) of $\xi_{ij}$ and $\xi_{ij}$ are given in Table 1 and graphically on Figures 24 and 25. These estimates are all based on equations 1 and 2.

Final forecasts (3) of $\xi_{ij}$ and $\xi_{ij}$ are found in the last two columns of Table 1 and are presented for visual appraisal on Figures 26 and 27. These results are based on equations 9 and 10.

[illegible] Use in [illegible] [illegible]

[illegible] Formulas for $\xi_{ij}$

The preliminary, residual, and final forecasts (2) of $\xi_{ij}$ and $\xi_{ij}$ are given in Table 2. These estimates are based on the use of cross-[illegible] 13 and 14 which correlate the [illegible] and the [illegible] [illegible]-[illegible] 24 and 25 present these results.

Final forecasts (3) of $\xi_{ij}$ and $\xi_{ij}$ are given in the last two columns of Table 2. These are based on equations 15 and 16 and are presented on Figures 28 and 29.

TABLE 7

Forecasts and Actual Values for $P_{BO}$ and $P_{HO}$ (Omaha)

| Year | Actual values | | Preliminary estimates | | Revised estimates | | Final estimates (1)a/ | | Final estimates (2)b/ | |
|---|---|---|---|---|---|---|---|---|---|---|
| | $P_{BO}$ | $P_{HO}$ | $P'_{BO}$ | $P'_{HO}$ | $P'_{BO}$ | $P'_{HO}$ | $P'_{BO}$ | $P'_{HO}$ | $P'_{BO}$ | $P'_{HO}$ |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | dollars per hundredweight | | | | | | | | | |
| 1949 | 26.14 | 19.65 | 28.11 | 22.84 | 29.51 | 21.65 | 26.43 | 20.35 | 26.05 | 18.98 |
| 1950 | 29.36 | 19.49 | 29.27 | 17.55 | 31.15 | 19.02 | 27.55 | 19.12 | 29.63 | 19.35 |
| 1951 | 35.28 | 21.00 | 29.23 | 18.40 | 31.34 | 18.18 | 33.85 | 20.26 | 34.77 | 19.93 |
| 1952 | 32.59 | 18.96 | 26.78 | 15.89 | 29.18 | 18.62 | 33.17 | 18.87 | 32.43 | 19.08 |
| 1953 | 23.43 | 22.82 | 25.84 | 21.42 | 25.81 | 22.68 | 25.06 | 19.94 | 23.16 | 23.28 |
| 1954 | 23.76 | 23.37 | 23.08 | 19.97 | 22.70 | 20.58 | 23.02 | 24.00 | 23.76 | 23.15 |
| 1955 | 22.96 | 16.29 | 23.80 | 18.35 | 22.86 | 16.14 | 22.30 | 16.82 | 23.21 | 16.74 |
| 1956 | 21.97 | 15.46 | 24.91 | 19.40 | 24.11 | 19.84 | 24.02 | 14.03 | 22.19 | 14.91 |
| 1957 | c/ | | 24.16 (25.09)d/ | 30.43 (22.87)d/ | 25.41 (24.85)e/ | 24.89 (23.01)e/ | | | | |

a/ Based on economic relationships for $X_1$ and $X_1^*$.

b/ Based on monthly average price for the May, June, July period as given by equations 9 and 10.

c/ Blank spaces indicate no data available or data not relevant to analysis.

d/ The computed value, $30.43, is considered to be unreasonable even if per-capita pork production should drop to 58.3 pounds in 1957. A maximum rise of about $8.00 over the current year's price is permitted. This assumes that the movement along the demand schedule for pork is not reversible over time for large contractions in per-capita supply. Using 62.3 pounds of pork production per capita, $P_{HO}$ = 22.87 and $P_{BO}$ = 25.09 as a revised result.

e/ Correction similar to d/. Use 62.3 pounds of pork production per capita. It is probable that the per-capita disposable income for 1957 will not reach the estimated value of $1,743 and should be corrected. Use $1,700 on the assumption of no increase over 1956.

TABLE 7

Forecasts and actual values for $F_{HO}$ and $F_{HO}$ (cents)

| Year | Actual prices | | Actual [illegible] attributes | | Trended estimates | | Final estimates (1)a/ | | Final [illegible] attributes (1)b/ | |
|---|---|---|---|---|---|---|---|---|---|---|
| | $F_{HO}$ | $F_{HO}$ | $F_{HO}$ | $F_{HO}$ | $F_{HO}^{1}$ | $F_{HO}^{1}$ | $F_{HO}^{1}$ | $F_{HO}^{1}$ | $F_{HO}^{1}$ | $F_{HO}^{1}$ |
| | Cents per [illegible] | | | | | | | | | |
| 1950 | 26.14 | 19.65 | 26.12 | 20.24 | 23.51 | 21.65 | 25.45 | 20.35 | 26.03 | [illegible] |
| 1951 | [illegible] | 19.60 | 23.65 | 17.65 | 21.15 | 19.72 | 23.25 | 18.12 | 23.[illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 1952 | 32.59 | 18.06 | 26.76 | 18.50 | 29.26 | 16.72 | 32.17 | 16.87 | [illegible] | [illegible] |
| 1953 | 25.46 | 22.32 | 25.04 | 21.02 | 22.81 | 22.22 | 25.06 | 18.94 | [illegible] | [illegible] |
| 1954 | 25.76 | 25.37 | 23.02 | 19.97 | 22.70 | 20.82 | 23.02 | 24.00 | 23.78 | [illegible] |
| 1955 | 22.25 | 16.20 | 23.80 | 18.35 | 22.24 | 16.14 | 22.30 | 16.82 | [illegible] | [illegible] |
| 1956 | 21.07 | 15.45 | 24.41 | 19.40 | 24.11 | 17.04 | 24.02 | 14.85 | [illegible] | [illegible] |
| 1957 | c/ | | 20.18 | 20.45 | 22.21 | 22.39 | | | | |

a/ Based on economic relationships for $X_1$ and $X_1^{*}$.

b/ Based on monthly average prices for the May, June, July period as given by equations 9 and 10.

c/ Blank spaces indicate no data available or data not relevant to analysis.

to 28.3 pounds in 1957. A minimum rise of about $4.00 over the current year's price is permitted. This [illegible] in day-to-day supply. During 28.3 pounds of pork production per capita, $F_{HO}^{1}$ = 22.57 and $F_{HO}^{1}$ = 23.0[illegible] [illegible] a corrected result.

[illegible] prices for 1957 will not reach the estimated value of [illegible] and should be corrected. Use [illegible] on [illegible]

FIGURE 24

Prices and Forecasts for 900 to 1,100 Pound Choice Slaughter Steers
(Omaha)

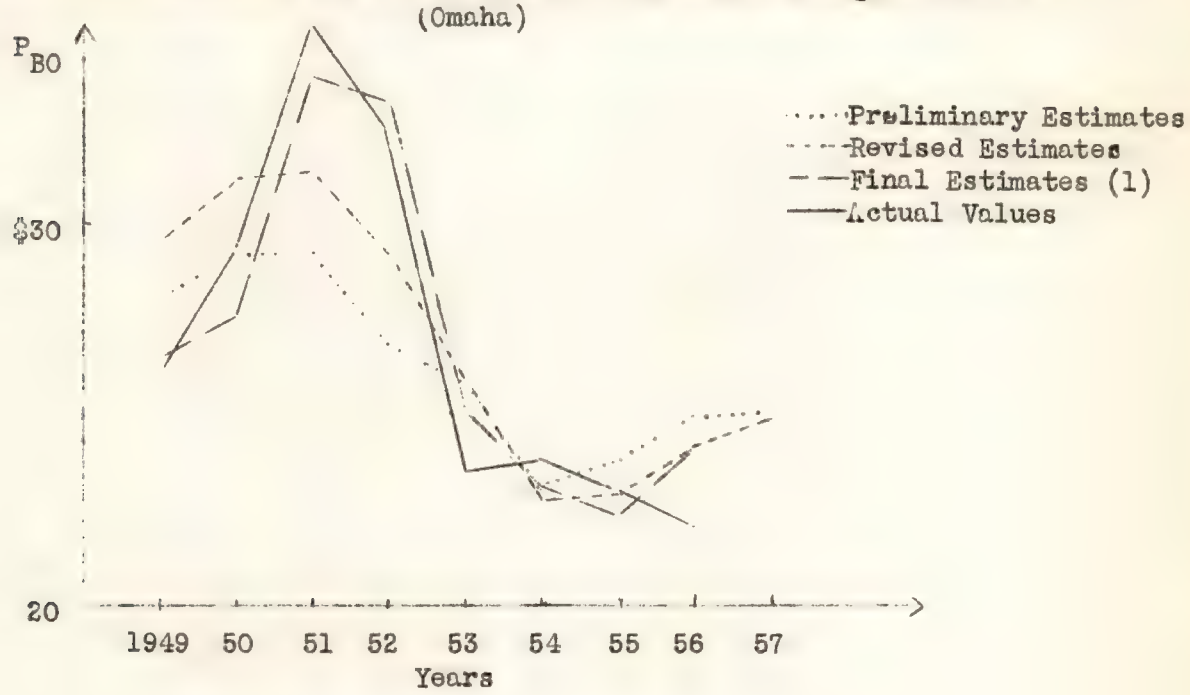



FIGURE 25

Prices and Forecasts for 200 to 220 Pound Choice Slaughter Hogs
(Omaha)

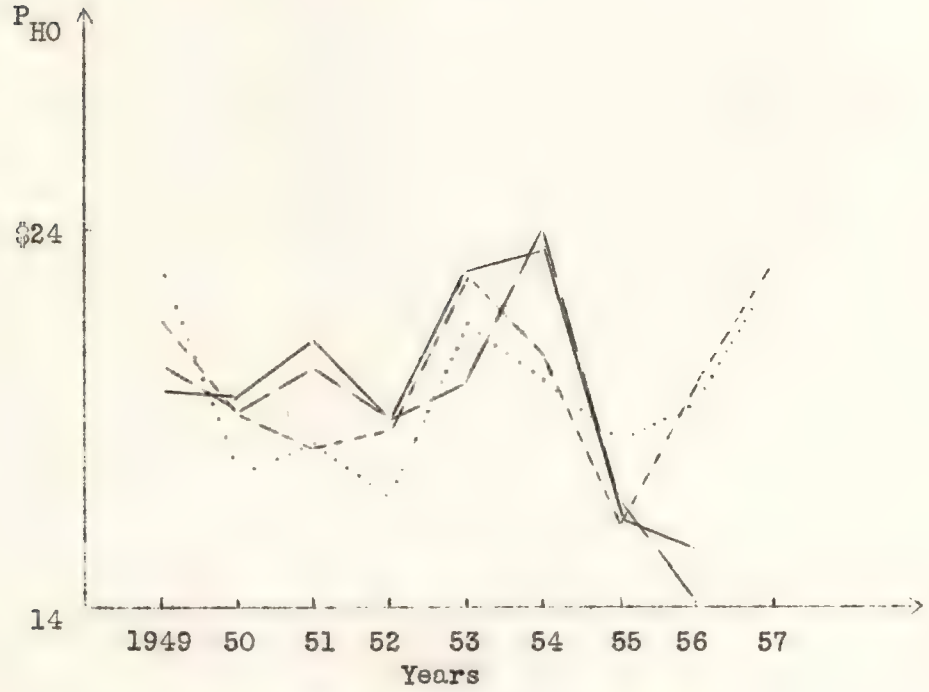


FIGURE 26

Prices and Forecasts for 900 to 1,100 Pound Choice Slaughter Steers
(Omaha)

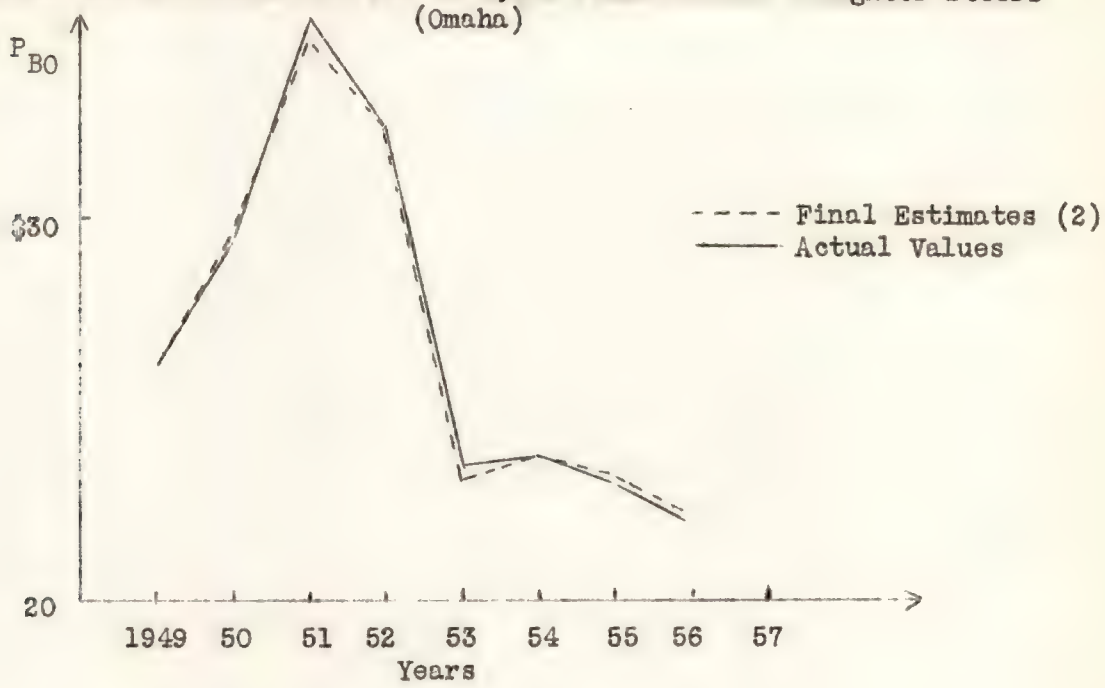



FIGURE 27

Prices and Forecasts for 200 to 220 Pound Choice Slaughter Steers
(Omaha)

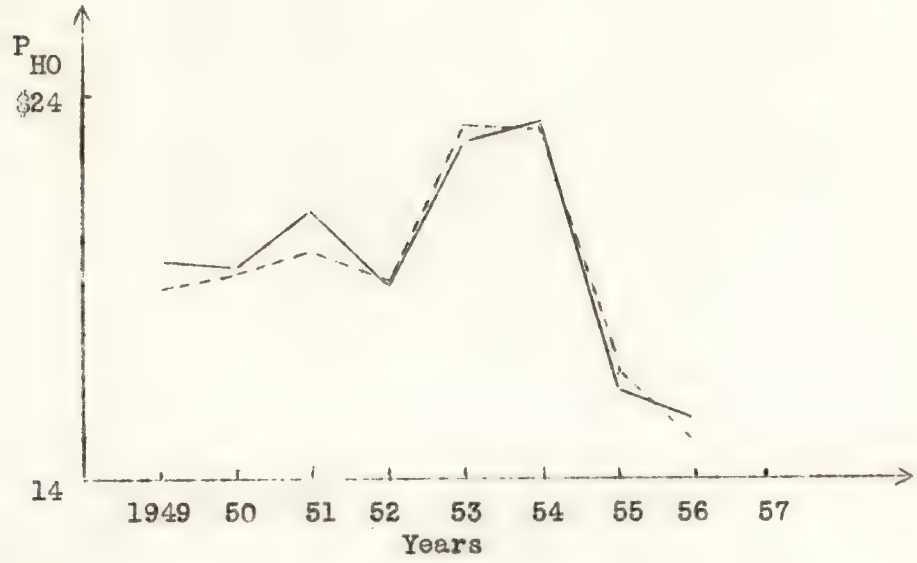


TABLE 8

Forecasts and Actual Values for $P_{BLA}$ and $P_{HLA}$ (Los Angeles)

| Year | Actual values | | Preliminary estimates a/ | | Revised estimates a/ | | Final estimates (1) a/ | | Final estimates (2) b/ | |
|---|---|---|---|---|---|---|---|---|---|---|
| | $P_{BLA}$ | $P_{HLA}$ | $P'_{BLA}$ | $P'_{HLA}$ | $P'_{BLA}$ | $P'_{HLA}$ | $P'_{BLA}$ | $P'_{HLA}$ | $P'_{BLA}$ | $P'_{HLA}$ |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | dollars per hundredweight | | | | | | | | | |
| 1949 | 25.38 | 21.47 | 27.96 | 24.01 | 29.29 | 22.95 | 26.36 | 21.79 | 25.37 | 20.83 |
| 1950 | 29.14 | 21.27 | 29.06 | 19.28 | 30.85 | 20.60 | 27.42 | 20.69 | 29.56 | 21.16 |
| 1951 | 36.30 | 22.76 | 29.02 | 20.04 | 31.03 | 19.85 | 33.42 | 21.71 | 35.36 | 21.70 |
| 1952 | 32.44 | 20.60 | 26.69 | 17.80 | 28.98 | 20.24 | 32.77 | 20.47 | 32.08 | 21.08 |
| 1953 | 23.88 | 23.93 | 25.80 | 22.75 | 25.77 | 23.86 | 25.05 | 21.42 | 23.26 | 24.38 |
| 1954 | 23.83 | 24.28 | 23.17 | 21.45 | 22.81 | 22.00 | 23.11 | 25.06 | 24.03 | 23.92 |
| 1955 | 23.16 | 17.83 | 23.86 | 20.00 | 22.96 | 18.02 | 22.43 | 18.63 | 23.36 | 18.02 |
| 1956 | 21.26 | 16.76 | 24.91 | 20.94 | 24.15 | 21.33 | 24.07 | 16.13 | 20.84 | 16.30 |
| 1957 | c/ | | 25.08 | 24.04 | 24.86 | 24.17 | | | | |

a/ Based on equations 11 and 12.

b/ Based on equations 13 and 14.

c/ Blank spaces indicate no data available or data not relevant to analysis.

[illegible]

[illegible]

[illegible]

FIGURE 28

Prices and Forecasts for 900 to 1,100 Pound Choice Slaughter Steers
(Los Angeles)

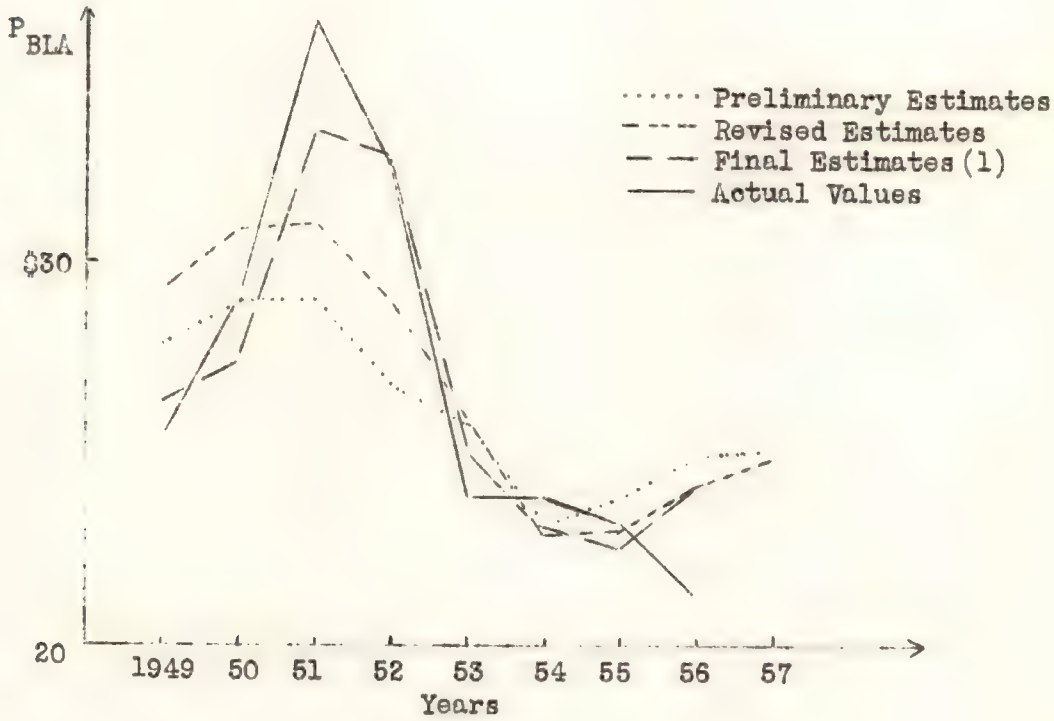



FIGURE 29

Prices and Forecasts for 200 to 220 Pound Choice Slaughter Hogs
(Los Angeles)

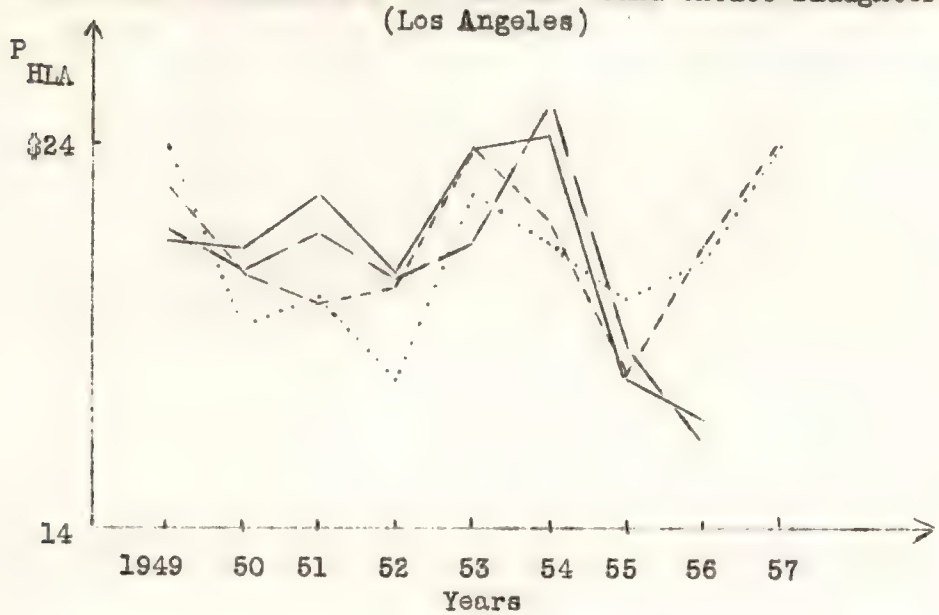


FIGURE 30

Prices and Forecasts for 900 to 1,100 Pound Choice Slaughter Steers
(Los Angeles)

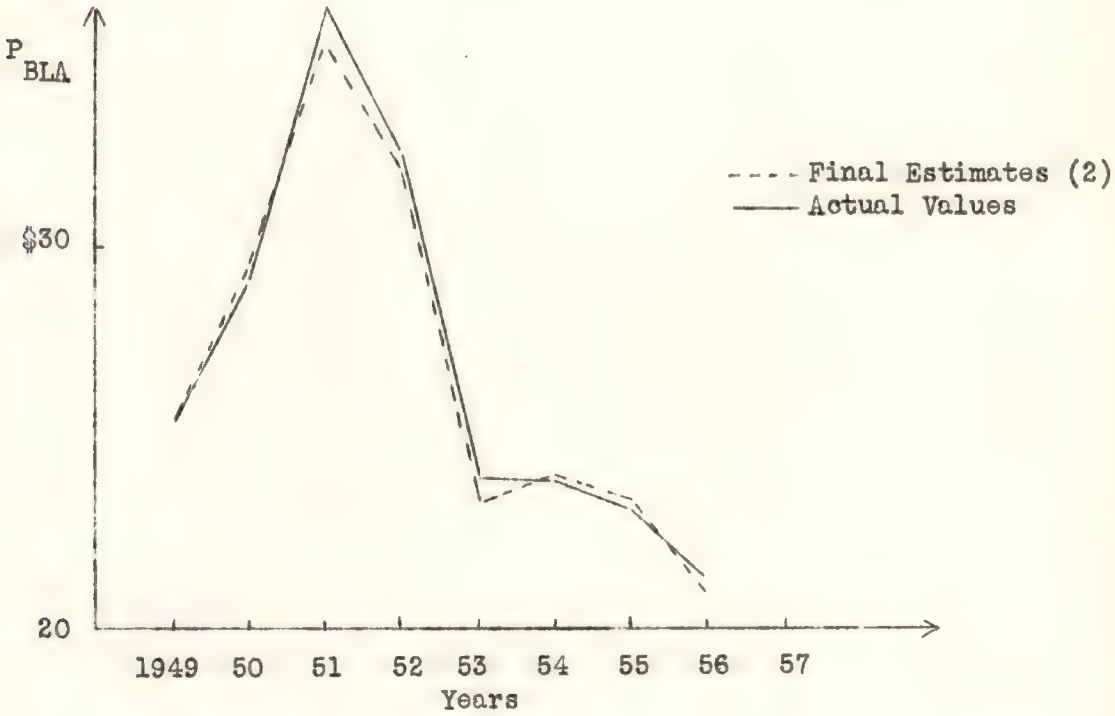
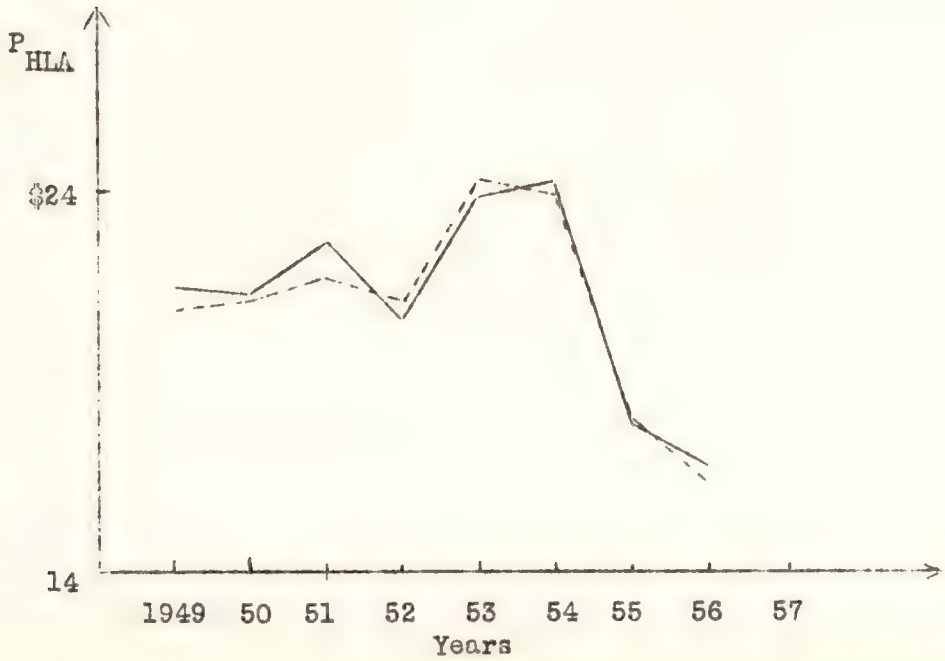



FIGURE 31

Prices and Forecasts for 200 to 220 Pound Choice Slaughter Hogs
(Los Angeles)



## V. The Monthly Forecasts

### A. General

Tables 9, 10, 11, and 12 give the monthly average prices at Omaha and Los Angeles for 900 to 1,100 pound choice slaughter steers and 200 to 220 pound choice slaughter hogs. Table 13 contains the computed indexes of seasonal variation for these prices. These indexes are used in the procedure of making monthly forecasts, especially for the January through July period. In later tables whenever one price is computed as being based on another price and no footnote is given for the method, then the method will be understood as employing these indexes in their relative magnitudes.

TABLE 9

Monthly Average Prices for 900 to 1,100 Pound Choice Slaughter Steers at Omaha

| Year | January | February | March | April | May | June | July | August | September | October | November | December | Annual average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dollars per hundredweight | | | | | | | | | | | | |
| 1949 | 24.98 | 22.30 | 23.94 | 23.74 | 24.30 | 26.03 | 25.44 | 26.33 | 27.96 | 29.42 | 29.89 | 29.32 | 26.14 |
| 1950 | 28.86 | 27.44 | 27.04 | 27.24 | 28.66 | 29.25 | 29.83 | 29.54 | 30.38 | 30.03 | 31.30 | 32.70 | 29.36 |
| 1951 | 34.84 | 35.88 | 35.66 | 36.36 | 35.41 | 34.81 | 34.74 | 35.30 | 36.07 | 35.16 | 35.09 | 34.02 | 35.28 |
| 1952 | 34.35 | 34.24 | 34.14 | 33.73 | 33.08 | 31.82 | 32.25 | 32.32 | 31.80 | 31.57 | 31.80 | 30.02 | 32.59 |
| 1953 | 27.41 | 24.49 | 22.20 | 21.19 | 21.73 | 20.92 | 23.43 | 24.07 | 24.65 | 24.12 | 23.66 | 23.27 | 23.43 |
| 1954 | 23.51 | 23.30 | 23.69 | 23.90 | 23.14 | 22.68 | 22.28 | 23.13 | 24.18 | 24.20 | 25.11 | 25.96 | 23.76 |
| 1955 | 27.36 | 26.06 | 25.65 | 24.32 | 22.20 | 21.82 | 22.20 | 21.99 | 22.49 | 21.51 | 20.32 | 19.55 | 22.96 |
| 1956 | 20.17 | 19.67 | 19.94 | 20.28 | 20.26 | 20.30 | 22.24 | 24.80 | 26.16 | 25.07 | 23.36 | 21.41 | 21.97 |
| 1957 | 20.94 | 20.12 | 21.44 | | | | | | | | | | |

TABLE 10

Monthly Average Prices for 200 to 220 Pound Choice Slaughter Hogs at Omaha

| Year | January | February | March | April | May | June | July | August | September | October | November | December | Annual average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dollars per hundredweight | | | | | | | | | | | | |
| 1949 | 20.60 | 20.14 | 21.61 | 18.97 | 19.22 | 21.18 | 22.04 | 21.88 | 20.87 | 18.20 | 15.81 | 15.29 | 19.65 |
| 1950 | 16.04 | 17.27 | 16.88 | 16.51 | 19.36 | 20.07 | 24.08 | 24.66 | 22.33 | 19.52 | 18.13 | 18.98 | 19.49 |
| 1951 | 20.70 | 22.75 | 21.98 | 21.30 | 21.17 | 22.05 | 22.04 | 22.42 | 20.85 | 20.42 | 18.43 | 17.88 | 21.00 |
| 1952 | 17.65 | 17.41 | 17.46 | 17.19 | 20.80 | 20.38 | 21.56 | 22.04 | 20.27 | 18.76 | 16.81 | 17.21 | 18.96 |
| 1953 | 18.44 | 20.18 | 21.13 | 22.31 | 24.16 | 24.76 | 26.26 | 25.07 | 24.90 | 21.46 | 21.01 | 24.25 | 22.83 |
| 1954 | 25.88 | 26.51 | 26.38 | 27.61 | 26.53 | 25.04 | 23.22 | 23.34 | 20.21 | 18.94 | 18.79 | 17.95 | 23.37 |
| 1955 | 17.66 | 17.18 | 16.76 | 17.54 | 17.62 | 19.94 | 18.21 | 16.81 | 16.50 | 14.40 | 12.04 | 10.78 | 16.29 |
| 1956 | 11.99 | 13.00 | 13.68 | 15.32 | 16.50 | 16.98 | 16.86 | 17.25 | 16.49 | 15.66 | 14.88 | 16.81 | 15.45 |
| 1957 | 18.27 | 17.42 | 17.76 | | | | | | | | | | |

TABLE 16

Monthly Average Prices for 200 to 220 Pound Chester Barrows at Omaha

| Year | January | February | March | April | May | June | July | August | September | October | November | December | Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cents per Pound | | | | | | | | | | | | |
| 1909 | [illegible] | [illegible] | 21.67 | 18.97 | 19.21 | 20.18 | 22.04 | 21.63 | 20.77 | 19.[illegible] | [illegible] | [illegible] | [illegible] |
| 1910 | [illegible] | [illegible] | 16.80 | 16.51 | 18.35 | 20.07 | 24.08 | 24.66 | 22.43 | [illegible] | [illegible] | [illegible] | [illegible] |
| 1911 | [illegible] | [illegible] | 21.98 | 21.20 | 21.17 | 22.05 | 22.04 | 22.42 | 20.65 | 20.[illegible] | [illegible] | [illegible] | [illegible] |
| 1912 | [illegible] | [illegible] | 17.46 | 17.19 | 20.80 | 20.38 | 21.96 | 22.04 | 20.27 | [illegible] | [illegible] | [illegible] | [illegible] |
| 1913 | [illegible] | [illegible] | 21.14 | 22.31 | 24.16 | 24.76 | 26.24 | 25.07 | 24.90 | 21.[illegible] | [illegible] | [illegible] | [illegible] |
| 1914 | [illegible] | [illegible] | 26.38 | 27.63 | 26.53 | 25.04 | 23.22 | 23.34 | 23.21 | [illegible] | [illegible] | [illegible] | [illegible] |
| 1915 | [illegible] | [illegible] | 16.76 | 17.04 | 17.62 | 18.94 | 17.21 | 16.37 | 16.56 | 14.40 | [illegible] | 10.[illegible] | [illegible] |
| 1916 | [illegible] | [illegible] | 13.68 | 15.32 | 14.50 | 16.92 | 16.86 | 17.25 | 16.40 | [illegible] | 16.[illegible] | [illegible] | [illegible] |
| 1917 | 18.27 | 17.[illegible] | [illegible] | | | | | | | | | | |

TABLE 11

Monthly Average Prices for 900 to 1,100 Pound Choice Slaughter Steers at Los Angeles

| Year | January | February | March | April | May | June | July | August | September | October | November | December | Annual average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dollars per hundredweight | | | | | | | | | | | | |
| 1949 | 23.90 | 21.55 | 25.39 | 25.12 | 25.57 | 26.35 | 26.12 | 25.71 | 26.24 | 26.00 | 26.35 | 26.21 | 25.38 |
| 1950 | 25.88 | 25.96 | 26.69 | 26.98 | 29.49 | 30.52 | 30.41 | 30.29 | 30.24 | 30.35 | 30.54 | 32.34 | 29.14 |
| 1951 | 34.25 | 35.94 | 36.46 | 36.50 | 36.21 | 36.24 | 35.82 | 35.90 | 36.84 | 37.15 | 37.52 | 36.74 | 36.30 |
| 1952 | 35.37 | 34.60 | 33.84 | 33.11 | 32.56 | 32.68 | 32.93 | 33.25 | 32.83 | 30.50 | 29.92 | 27.65 | 32.44 |
| 1953 | 25.77 | 24.33 | 23.81 | 22.57 | 24.08 | 23.44 | 23.50 | 24.09 | 23.53 | 23.08 | 24.19 | 24.22 | 23.88 |
| 1954 | 24.16 | 23.13 | 23.12 | 23.92 | 24.83 | 24.40 | 24.16 | 24.04 | 24.15 | 23.73 | 22.88 | 23.43 | 23.83 |
| 1955 | 24.38 | 23.90 | 24.00 | 24.38 | 24.08 | 23.73 | 23.50 | 23.47 | 22.90 | 22.38 | 21.09 | 20.16 | 23.16 |
| 1956 | 19.90 | 18.94 | 20.31 | 20.44 | 20.50 | 21.31 | 21.72 | 23.55 | 24.06 | 22.95 | 20.69 | 20.69 | 21.26 |
| 1957 | 20.25 | 20.05 | 22.14 | | | | | | | | | | |

TABLE 11

Monthly Average Ozone for 900 to 1,100 Pound Choice Slaughter Steers at Los Angeles

| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [illegible] | [illegible] | 27.39 | 28.12 | 27.37 | 26.39 | 26.12 | 25.71 | 26.14 | 26.02 | 26.37 | [illegible] | [illegible] |
| [illegible] | [illegible] | 28.19 | 28.20 | 29.46 | 30.52 | 31.41 | 30.27 | 30.04 | 30.35 | 30.51 | [illegible] | [illegible] |
| [illegible] | [illegible] | 34.44 | 34.60 | 36.21 | 36.44 | 35.02 | 34.20 | 34.44 | 37.15 | 37.52 | [illegible] | [illegible] |
| [illegible] | [illegible] | 34.44 | 33.22 | 34.45 | 32.64 | 32.42 | 33.27 | 32.84 | 30.50 | 29.92 | [illegible] | [illegible] |
| [illegible] | [illegible] | 23.31 | 22.57 | 22.45 | 23.46 | 23.40 | 24.00 | 22.45 | 23.68 | 21.39 | [illegible] | [illegible] |
| [illegible] | [illegible] | 23.12 | 27.92 | 24.39 | 24.40 | 21.16 | 21.04 | 24.15 | 23.73 | 22.65 | [illegible] | [illegible] |
| [illegible] | [illegible] | 24.00 | 23.30 | 23.00 | 21.72 | 23.50 | 23.37 | 22.37 | 22.36 | 21.44 | [illegible] | [illegible] |
| [illegible] | [illegible] | 20.31 | 20.84 | 20.90 | 21.32 | 21.72 | 23.35 | 21.04 | 22.44 | 20.69 | [illegible] | [illegible] |
| [illegible] | [illegible] | 22.44 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

TABLE 12

Monthly Average Prices for 200 to 220 Pound Choice Slaughter Hogs at Los Angeles

| Year | January | February | March | April | May | June | July | August | September | October | November | December | Annual average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dollars per hundredweight | | | | | | | | | | | | |
| 1949 | 23.20 | 22.72 | 22.99 | 21.32 | 21.37 | 22.34 | 23.78 | 23.35 | 22.69 | 20.01 | 17.26 | 16.64 | 21.47 |
| 1950 | 17.50 | 19.18 | 18.72 | 18.53 | 21.20 | 21.90 | 25.37 | 26.10 | 24.20 | 21.68 | 20.17 | 20.66 | 21.27 |
| 1951 | 22.53 | 24.42 | 23.78 | 23.54 | 22.75 | 23.48 | 23.82 | 24.23 | 22.71 | 22.17 | 20.06 | 19.61 | 22.76 |
| 1952 | 19.50 | 18.96 | 18.89 | 18.75 | 21.87 | 22.42 | 23.92 | 23.98 | 21.19 | 20.62 | 18.60 | 18.48 | 20.60 |
| 1953 | 19.72 | 22.20 | 22.62 | 23.42 | 25.35 | 25.81 | 26.73 | 25.86 | 25.79 | 23.20 | 21.78 | 24.64 | 23.93 |
| 1954 | 26.36 | 26.65 | 27.44 | 28.40 | 27.31 | 25.82 | 23.40 | 23.75 | 21.65 | 20.56 | 20.38 | 19.58 | 24.28 |
| 1955 | 19.44 | 18.96 | 18.20 | 18.84 | 18.78 | 20.70 | 19.81 | 17.85 | 17.85 | 16.74 | 14.30 | 12.50 | 17.78 |
| 1956 | 12.95 | 13.81 | 14.68 | 16.50 | 17.58 | 18.66 | 18.00 | 18.36 | 17.99 | 17.46 | 16.47 | 18.60 | 16.76 |
| 1957 | 19.90 | 19.78 | 19.22 | | | | | | | | | | |

Table 6

Monthly Average Prices for 200 to 270 Pound Choice Slaughter Hogs at Iowa Agency's

| Year | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 24.40 | 21.72 | [illegible] | 21.[illegible] | 20.17 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 23.17 |
| 1961 | 18.[illegible] | 17.41 | 15.[illegible] | 16.[illegible] | 17.[illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 18.47 |
| 1962 | 19.[illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 21.74 |
| 1963 | 19.30 | 16.96 | 18.[illegible] | 16.75 | 21.[illegible] | 22.42 | 23.[illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 1964 | 18.72 | 22.20 | 22.[illegible] | 23.42 | 25.35 | 25.81 | 26.[illegible] | 25.86 | [illegible] | [illegible] | [illegible] | 21.4[illegible] |
| 1965 | [illegible] | 24.05 | 21.[illegible] | 20.40 | 27.21 | 25.02 | 22.40 | 23.75 | [illegible] | [illegible] | [illegible] | [illegible] |
| 1966 | 18.[illegible] | 17.[illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 1967 | 14.[illegible] | 14.[illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 1968 | 14.[illegible] | 16.[illegible] | [illegible] | | | | | | | | | |

TABLE 13

Seasonal Indexes of Prices for Omaha and Los Angeles on 900 to 1,100 Pound Choice Slaughter Steers and 200 to 220 Pound Choice Slaughter Hogs (Based on Monthly Average Prices, 1949-1955)

| | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Omaha: | | | | | | | | | | | | |
| 900 to 1,100 pound choice steers | 103 | 100 | 99 | 98 | 97 | 95 | 98 | 100 | 102 | 102 | 103 | 103 |
| 200 to 220 pound choice hogs | 93 | 98 | 97 | 99 | 105 | 109 | 111 | 112 | 104 | 95 | 88 | 89 |
| Los Angeles: | | | | | | | | | | | | |
| 900 to 1,100 pound choice steers | 99 | 98 | 98 | 99 | 101 | 101 | 101 | 101 | 102 | 100 | 100 | 100 |
| 200 to 220 pound choice hogs | 94 | 98 | 98 | 100 | 104 | 107 | 110 | 109 | 106 | 97 | 89 | 88 |

B. Omaha Market

1. January Through July Period

Table 14 and Figure 32 give the preliminary and revised forecasts of the cattle prices. Table 16 and Figure 34 give comparable results for the hog prices, excluding the revised forecasts. In all cases the forecasts are computed as two straight line sequences--January through April and April through July. Consequently, the primary points are January, April, and July. Forecasts for January and April are based on the relative indexes with respect to December. The December base is either a final forecast from the previous year or the actual average price for the first week. Forecasts for July are based equally on the December level and the preliminary forecast for the annual average level.

Final forecasts (February through July) and revised final forecasts (May through July) are given in Tables 15 and 17 and Figures 33 and 35 for cattle and hogs. The essential changes in making the final forecasts are (1) the actual price in January is used in lieu of December forecasts, (2) the April forecast is based equally on the January level and the linear trend through January and February to April, and (3) the July forecast is based equally on the January price and the revised forecast for the annual average level. Revised final forecasts for May through July are merely adjustments for one half the error of the forecast for April.

TABLE 14

Preliminary and Revised Forecasts of January-July Monthly Average Prices for 900 to 1,100 Pound Choice Slaughter Steers at Omaha

| Year | $P'_{BO}$ a/ | $p_{12}$ b/ | $p_1$ based on $p_{12}$ | $p_4$ based on $p_{12}$ | $p_7$ based on $p_{12}$ | $p_7$ based on $P'_{BO}$ | $p_7$ average | $p_1$ c/ | $p_2$ c/ | $p_3$ c/ | $p_4$ c/ | $p_5$ c/ | $p_6$ c/ | $p_7$ c/ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dollars | | | | | | | | | | | | | |
| 1950 | 29.27 | 30.80 | 30.80 | 29.26 | 29.26 | 28.68 | 28.97 | 30.80 | 30.29 | 29.77 | 29.26 | 29.16 | 29.06 | 28.97 |
| | 29.27 | 29.95 | 29.95 | 28.45 | 28.45 | 28.68 | 28.56 | 29.95 | 29.45 | 28.95 | 28.45 | 28.49 | 28.52 | 28.56 |
| 1951 | 29.23 | 33.20 | 33.20 | 31.54 | 31.54 | 28.65 | 30.10 | 33.20 | 32.64 | 32.09 | 31.54 | 31.06 | 30.58 | 30.10 |
| | 29.23 | 32.88 | 32.88 | 31.24 | 31.24 | 28.65 | 29.94 | 32.88 | 32.33 | 31.79 | 31.24 | 30.81 | 30.37 | 29.94 |
| 1952 | 26.78 | 32.86 | 32.86 | 31.22 | 31.22 | 26.24 | 28.73 | 32.86 | 32.31 | 31.77 | 31.22 | 30.39 | 29.56 | 28.73 |
| | 26.78 | 34.88 | 34.88 | 33.14 | 33.14 | 26.24 | 29.69 | 34.88 | 34.30 | 33.72 | 33.14 | 31.99 | 30.84 | 29.69 |
| 1953 | 25.84 | 30.00 | 30.00 | 28.50 | 28.50 | 25.32 | 26.91 | 30.00 | 29.50 | 29.00 | 28.50 | 27.97 | 27.44 | 26.91 |
| | 25.84 | 30.85 | 30.85 | 29.31 | 29.31 | 25.32 | 27.32 | 30.85 | 30.34 | 29.82 | 29.31 | 28.65 | 27.98 | 27.32 |
| 1954 | 23.08 | 22.89 | 22.89 | 21.75 | 21.75 | 22.62 | 22.18 | 22.89 | 22.51 | 22.13 | 21.75 | 21.89 | 22.04 | 22.18 |
| | 23.08 | 23.60 | 23.60 | 22.42 | 22.42 | 22.62 | 22.52 | 23.60 | 23.20 | 22.81 | 22.42 | 22.45 | 22.49 | 22.52 |
| 1955 | 23.80 | 25.94 | 25.94 | 24.64 | 24.64 | 23.32 | 23.98 | 25.94 | 25.51 | 25.07 | 24.64 | 26.42 | 24.20 | 23.98 |
| | 23.80 | 25.60 | 25.60 | 24.32 | 24.32 | 23.32 | 23.82 | 25.60 | 25.17 | 24.75 | 24.32 | 24.15 | 23.99 | 23.82 |
| 1956 | 24.91 | 21.14 | 21.14 | 20.08 | 20.08 | 24.41 | 22.24 | 21.14 | 21.03 | 20.91 | 20.80 | 21.28 | 21.76 | 22.24 |
| | 24.91 | 20.32 | 20.32 | 19.30 | 19.30 | 24.41 | 21.86 | 20.32 | 19.98 | 19.64 | 19.30 | 20.15 | 21.01 | 21.86 |
| 1957 | 25.09 | 25.16 | 25.16 | 23.90 | 23.90 | 24.59 | 24.25 | 25.16 | 24.74 | 24.32 | 23.90 | 24.02 | 24.13 | 24.25 |
| | 25.09 | 21.80 | 21.80 | 20.71 | 20.71 | 24.59 | 22.65 | 21.80 | 21.44 | 21.07 | 20.71 | 21.36 | 22.00 | 22.65 |

a/ Preliminary estimates made in August of preceding year.

b/ Final estimates of $p_{12}$ for previous year (upper). Actual prices for first week of December (lower).

c/ Upper values are preliminary estimates made in August of preceding year. Lower values are revised estimates made in December of preceding year.

FIGURE 32

Preliminary and Revised Forecasts and Actual Monthly Average Prices for 900 to 1,100 Pound Choice Slaughter Steers at Omaha (January-July)

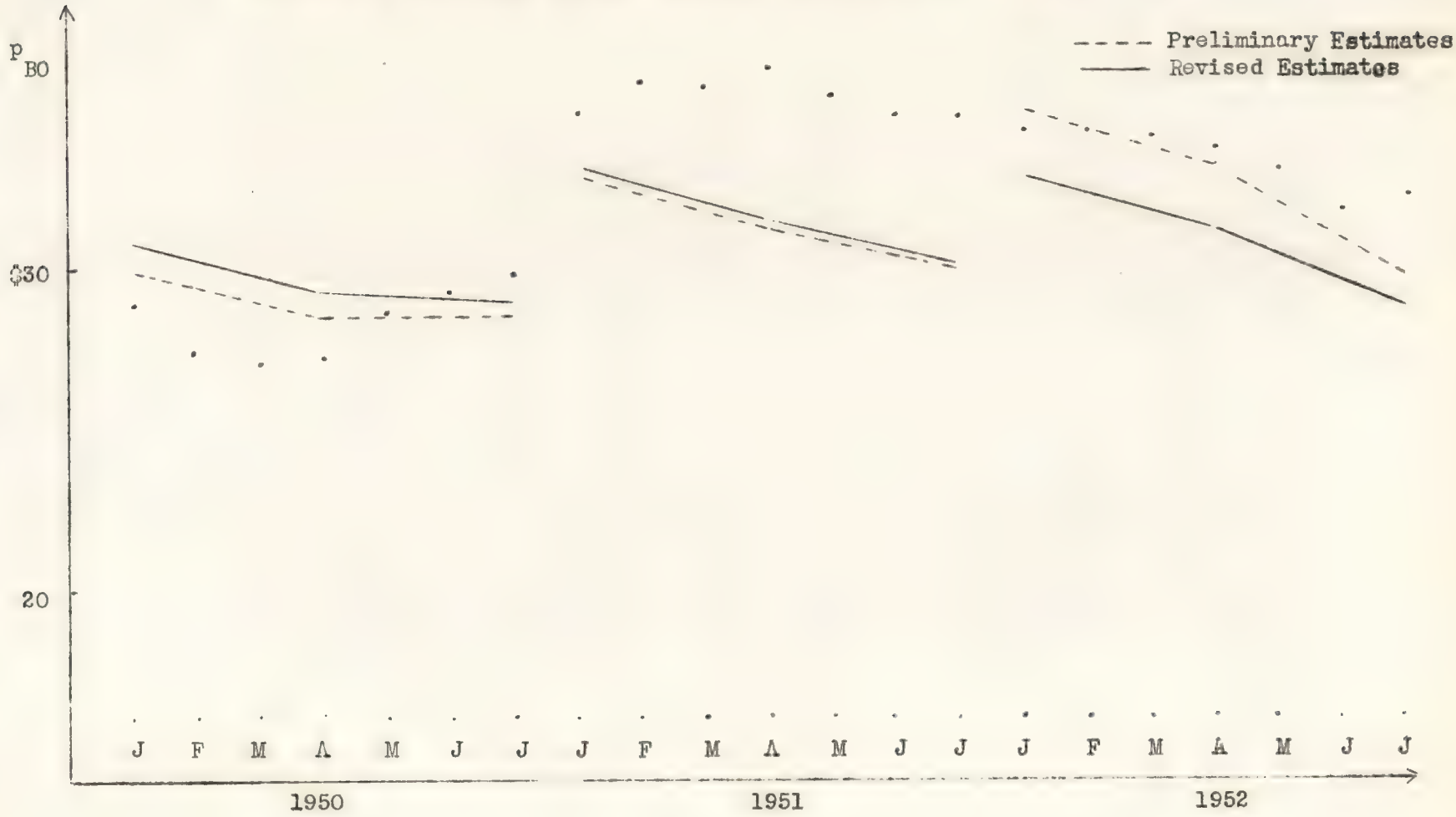


FIGURE 32 Continued

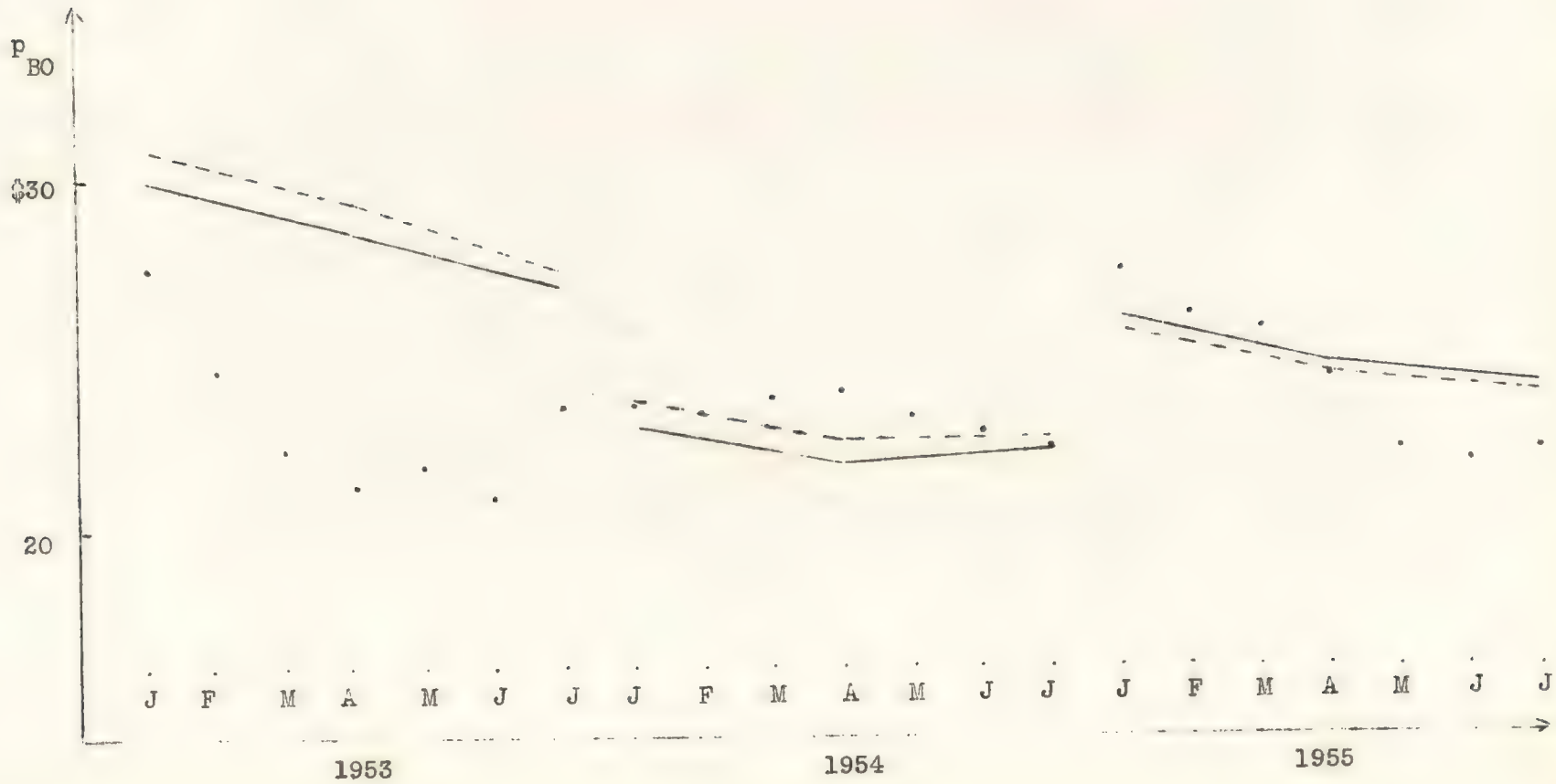


FIGURE 32 Continued

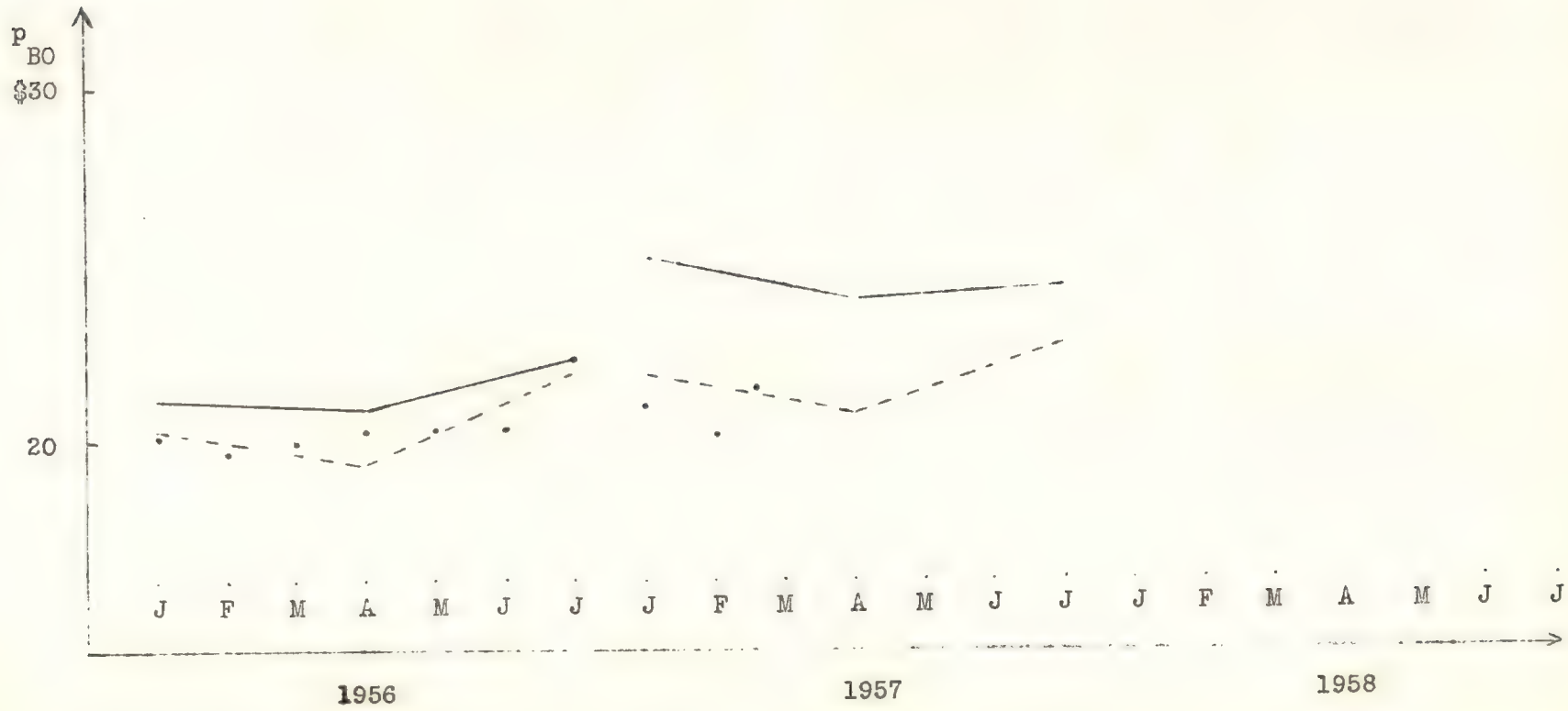


TABLE 15

Final and Revised Final Forecasts of January-July Monthly Average Prices for 900 to 1,100 Pound Choice Slaughter Steers at Omaha

| Year | $p'_{BO}$ a/ | $p_1$ | $p'_2$ b/ | $p_4$ based on $p_1$ | $p_4$ based on $p_1$ and $p'_2$ c/ | $p_4$ average | $p_7$ based on $p_1$ | $p_7$ based on $P'_{BO}$ | $p_7$ average | $p_3$ | $p_4$ d/ | $p_5$ d/ | $p_6$ d/ | $p_7$ d/ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dollars | | | | | | | | | | | | | |
| 1949 | 29.51 | 24.98 | 22.28 | 23.73 | 16.88 | 20.30 | 23.73 | 28.92 | 26.32 | 21.29 | 20.30 | 22.31 | 24.31 | 26.32 |
| | | | | | | | | | | | 22.02 | 24.03 | 26.03 | 28.04 |
| 1950 | 31.15 | 28.86 | 27.72 | 27.42 | 25.44 | 26.43 | 27.42 | 30.53 | 28.98 | 27.08 | 26.43 | 27.28 | 28.13 | 28.98 |
| | | | | | | | | | | | 26.84 | 27.69 | 28.54 | 29.39 |
| 1951 | 31.34 | 34.84 | 35.88 | 33.10 | 37.96 | 35.53 | 33.10 | 30.71 | 31.90 | 35.60 | 35.33 | 34.19 | 33.04 | 31.90 |
| | | | | | | | | | | | 35.84 | 34.70 | 33.55 | 32.41 |
| 1952 | 29.18 | 34.35 | 34.38 | 32.63 | 34.44 | 33.54 | 32.63 | 28.60 | 30.62 | 33.96 | 33.54 | 32.57 | 31.59 | 30.62 |
| | | | | | | | | | | | 33.64 | 32.67 | 31.69 | 30.72 |
| 1953 | 25.81 | 27.41 | 25.45 | 26.04 | 21.53 | 23.78 | 26.04 | 25.29 | 25.66 | 24.62 | 23.78 | 24.41 | 25.03 | 25.66 |
| | | | | | | | | | | | 22.48 | 23.11 | 23.73 | 24.36 |
| 1954 | 22.70 | 23.51 | 23.02 | 22.33 | 22.04 | 22.18 | 22.33 | 22.25 | 22.29 | 22.60 | 22.18 | 22.22 | 22.25 | 22.29 |
| | | | | | | | | | | | 23.04 | 23.08 | 23.11 | 23.15 |
| 1955 | 22.86 | 27.36 | 26.90 | 25.99 | 25.98 | 25.98 | 25.99 | 22.40 | 24.20 | 26.44 | 25.98 | 25.39 | 24.79 | 24.20 |
| | | | | | | | | | | | 25.15 | 24.56 | 23.96 | 23.37 |
| 1956 | 24.11 | 20.17 | 19.85 | 19.16 | 19.21 | 19.18 | 19.16 | 23.63 | 21.40 | 19.52 | 19.18 | 19.92 | 20.66 | 21.40 |
| | | | | | | | | | | | 19.73 | 20.47 | 21.21 | 21.95 |
| 1957 | 24.85 | 20.94 | 20.20 | 19.89 | 18.70 | 19.30 | 19.89 | 24.35 | 22.12 | 19.85 | 19.30 | 20.24 | 21.18 | 22.12 |

a/ Revised estimates made in February.

b/ Actual prices for first week of February; also taken as $p_2$.

c/ $p_4 = p_1 - 3(p_1 - p'_2)$.

d/ Lower values represent revised final estimates for May through July. Although the value for April appears, it is not effective since the computation is made at the beginning of May. The value for April is taken as the average of the predicted and actual price. May, June, and July are extended parallel to the previous estimates.

FIGURE 33

Final and Revised Final Forecasts and Actual Monthly Average Prices for 900 to 1,100 Pound Choice Slaughter Steers at Omaha (January-July)

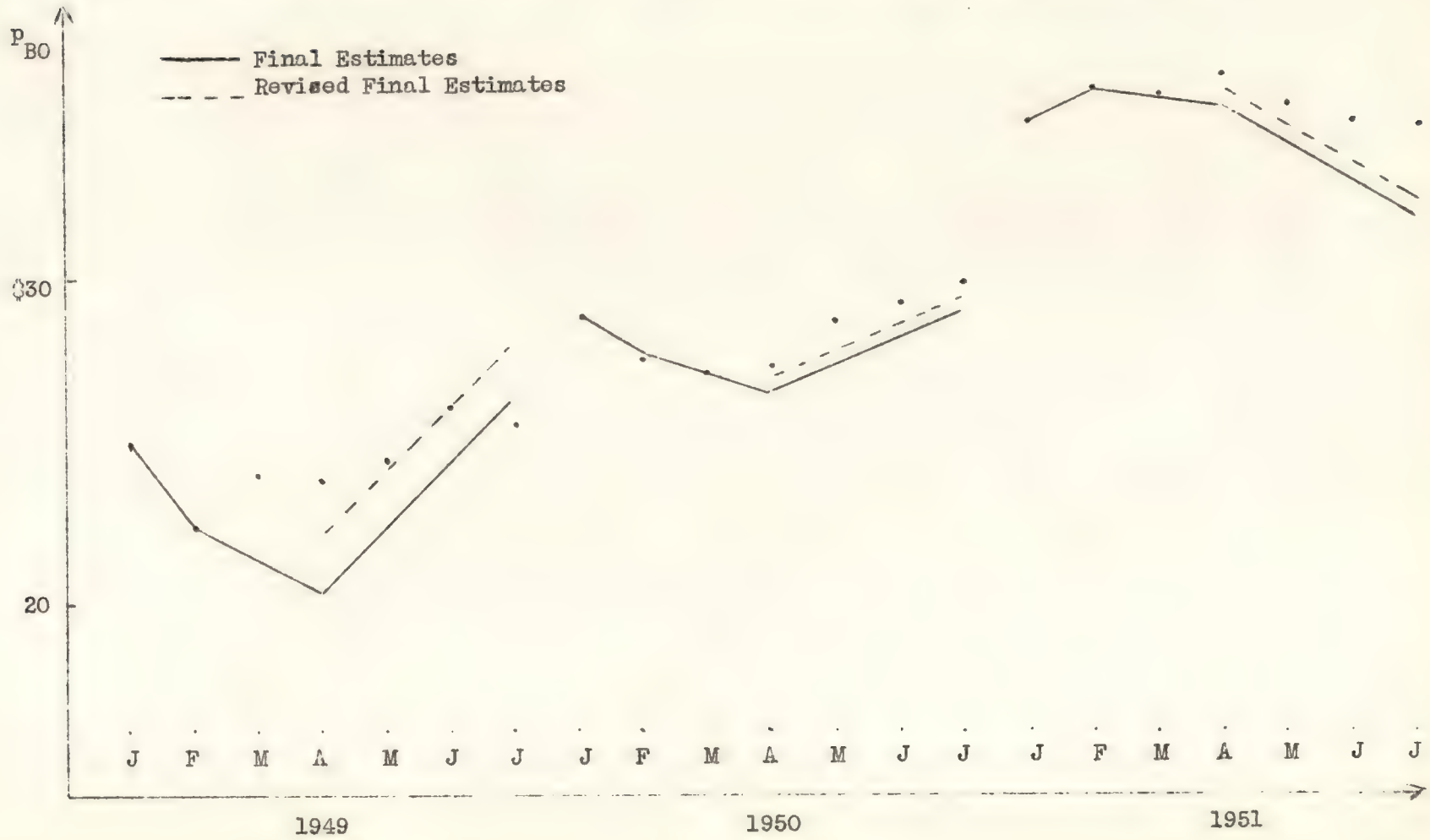


FIGURE 33 Continued

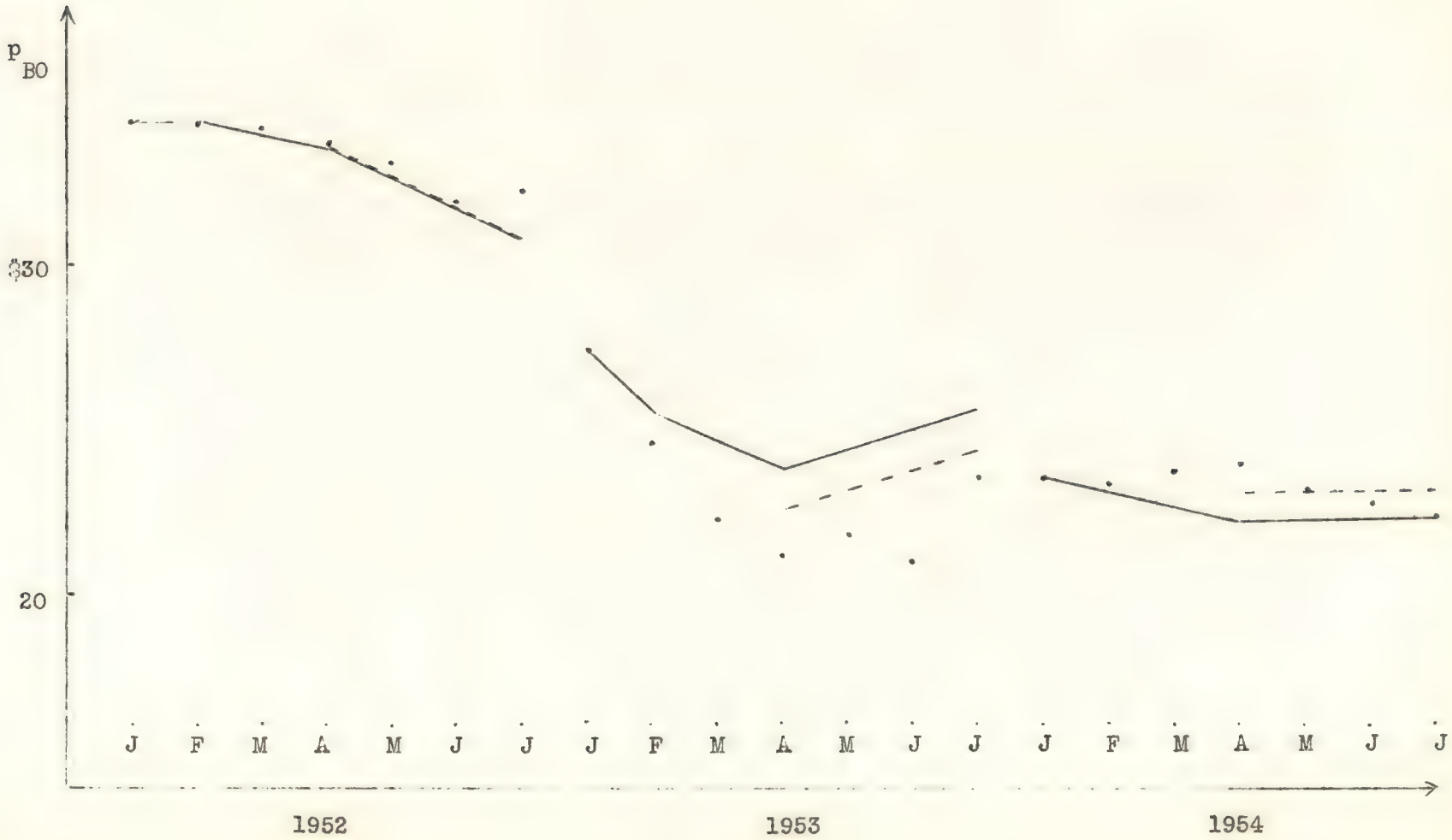


FIGURE 33 Continued

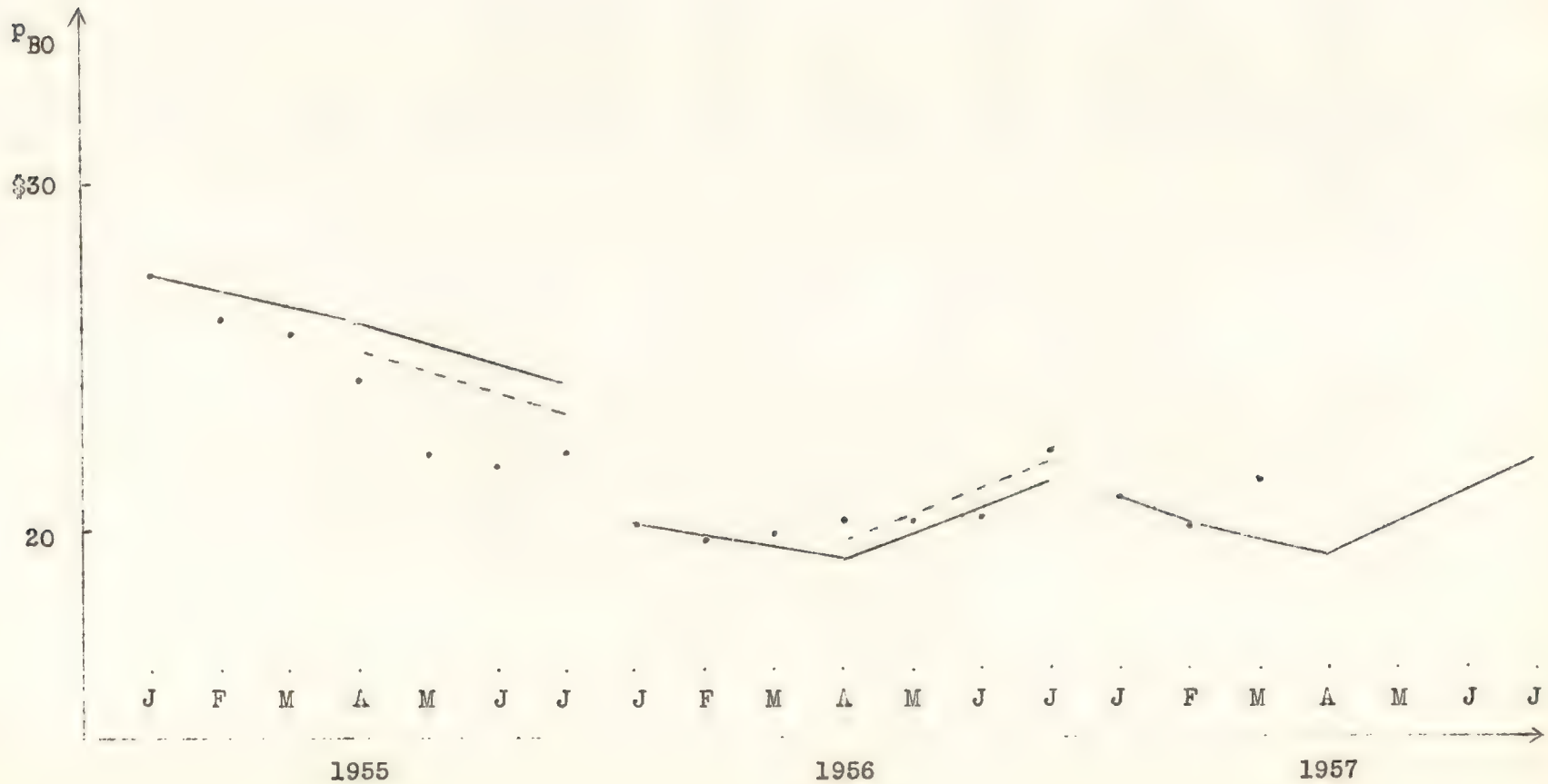


TABLE 16

Preliminary Forecasts of January-July Monthly Average Prices for 200 to 220 Pound Choice Slaughter Hogs at Omaha

| Year | $P'_{HO}$ a/ | $p_{12}$ b/ | $p_1$ based on $p_{12}$ | $p_4$ based on $p_{12}$ | $p_7$ based on $p_{12}$ | $p_7$ based on $P'_{HO}$ | $p_7$ average | $p_1$ | $p_2$ | $p_3$ | $p_4$ | $p_5$ | $p_6$ | $p_7$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dollars | | | | | | | | | | | | | |
| 1950 | 17.55 | 16.24 | 16.89 | 18.03 | 20.30 | 19.48 | 19.89 | 16.89 | 17.27 | 17.65 | 18.03 | 18.65 | 19.27 | 19.89 |
| 1951 | 18.40 | 18.72 | 19.47 | 20.78 | 23.40 | 20.42 | 21.91 | 19.47 | 19.91 | 20.34 | 20.78 | 21.16 | 21.53 | 21.91 |
| 1952 | 15.89 | 17.37 | 18.05 | 19.28 | 21.71 | 17.64 | 19.68 | 18.05 | 18.46 | 18.87 | 19.28 | 19.41 | 19.55 | 19.68 |
| 1953 | 21.42 | 17.42 | 18.12 | 19.34 | 21.78 | 23.78 | 22.78 | 18.12 | 18.53 | 18.93 | 19.34 | 20.49 | 21.63 | 22.78 |
| 1954 | 19.97 | 20.71 | 21.54 | 22.99 | 25.89 | 22.17 | 24.03 | 21.54 | 22.02 | 22.51 | 22.99 | 23.34 | 23.68 | 24.03 |
| 1955 | 18.35 | 16.74 | 17.41 | 18.58 | 20.92 | 20.37 | 20.64 | 17.41 | 17.80 | 18.19 | 18.58 | 19.27 | 19.95 | 20.64 |
| 1956 | 19.40 | 13.68 | 14.23 | 15.18 | 17.10 | 21.53 | 19.32 | 14.23 | 14.55 | 14.86 | 15.18 | 16.56 | 17.94 | 19.32 |
| 1957 | 22.87 | 13.55 | 14.08 | 15.04 | 16.94 | 25.39 | 21.16 | 14.08 | 14.40 | 14.72 | 15.04 | 17.08 | 19.12 | 21.16 |

a/ Preliminary estimates made in August of preceding year.

b/ Final estimates for $p_{12}$ for previous year.

FIGURE 34

Preliminary Forecasts and Actual Monthly Average Prices
for 200 to 220 Pound Choice Slaughter Hogs at Omaha (January-July)

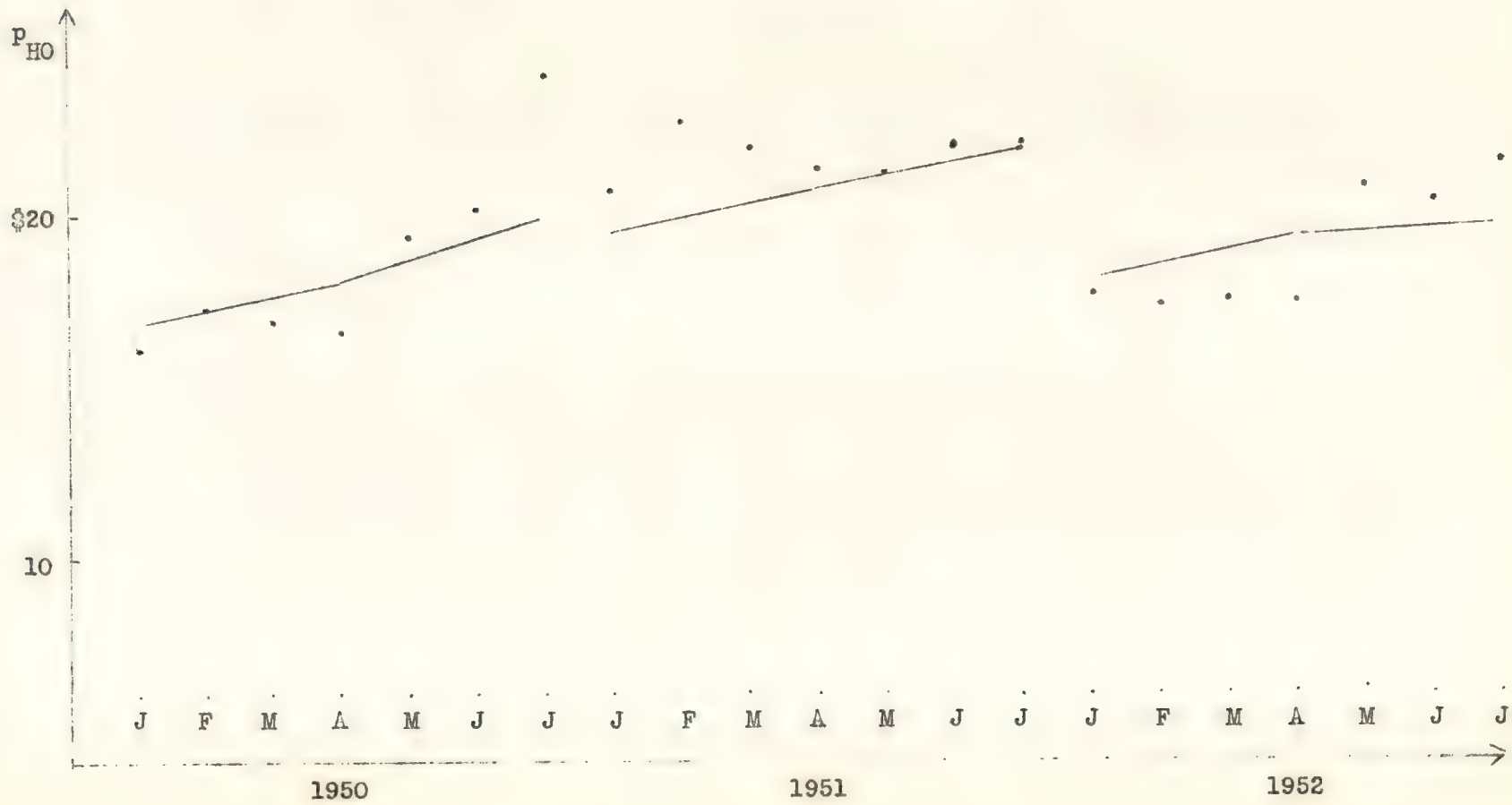


FIGURE 34 Continued

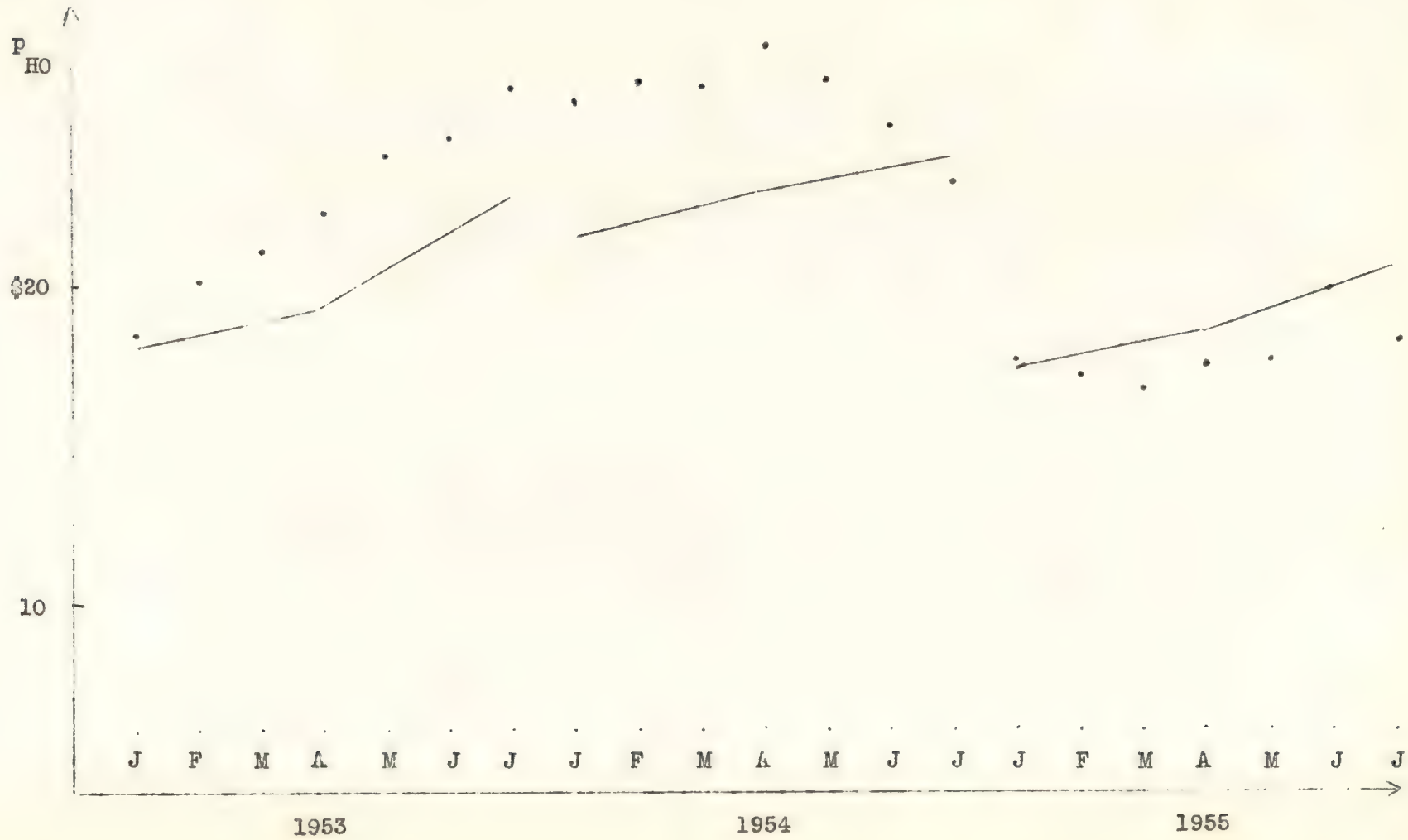


FIGURE 34 Continued

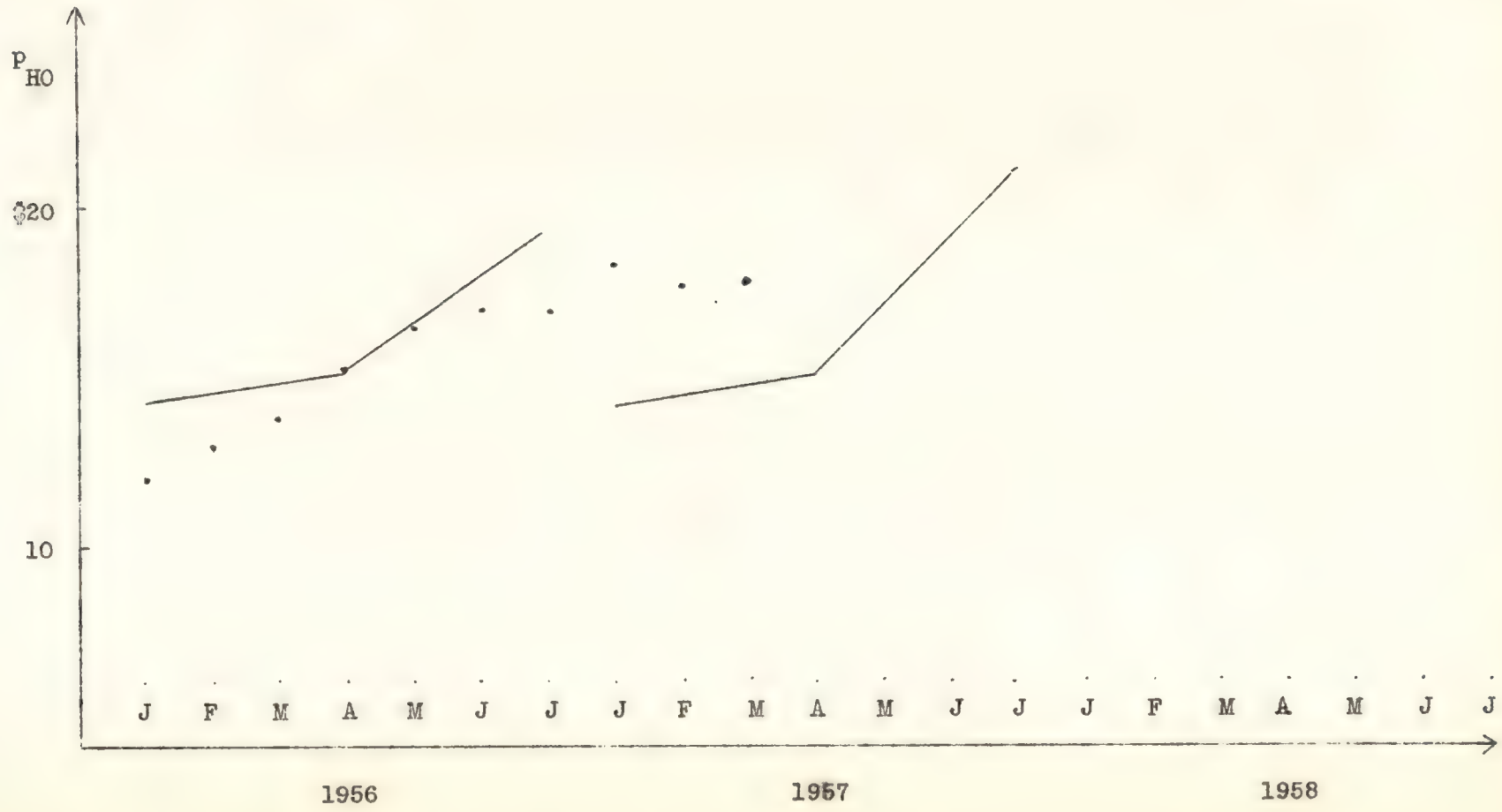


TABLE 17

Final and Revised Final Forecasts of January-July Monthly Average Prices for 200 to 220 Pound Choice Slaughter Hogs at Omaha

| Year | $P'_{HO}$ a/ | $p_1$ | $p'_2$ b/ | $p_4$ based on $p_1$ | $p_4$ based on $p_1$ and $p'_2$ | $p_4$ average | $p_7$ based on $p_1$ | $p_7$ based on $P'_{HO}$ | $p_7$ average | $p_3$ | $p_4$ d/ | $p_5$ d/ | $p_6$ d/ | $p_7$ d/ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dollars | | | | | | | | | | | | | |
| 1949 | 21.65 | 20.60 | 19.92 | 21.84 | 18.56 | 20.20 | 24.51 | 24.03 | 24.27 | 20.06 | 20.20<br>n.r. e/ | 21.56<br>n.r. | 22.91<br>n.r. | 24.27<br>n.r. |
| 1950 | 19.02 | 16.04 | 17.30 | 17.00 | 19.82 | 18.41 | 19.09 | 21.11 | 20.10 | 17.86 | 18.41<br>n.r. | 18.97<br>n.r. | 19.54<br>n.r. | 20.10<br>n.r. |
| 1951 | 18.18 | 20.70 | 21.71 | 21.94 | 23.73 | 22.84 | 24.63 | 20.18 | 22.40 | 22.28 | 22.84<br>n.r. | 22.69<br>n.r. | 22.55<br>n.r. | 22.40<br>n.r. |
| 1952 | 18.62 | 17.65 | 17.38 | 18.71 | 16.84 | 17.78 | 21.00 | 20.67 | 20.84 | 17.63 | 17.78<br>n.r. | 18.80<br>n.r. | 19.82<br>n.r. | 20.84<br>n.r. |
| 1953 | 22.68 | 18.44 | 18.72 | 19.55 | 19.28 | 19.42 | 21.94 | 25.17 | 23.56 | 19.07 | 19.42<br>22.31 | 20.80<br>23.69 | 22.18<br>25.07 | 23.56<br>26.45 |
| 1954 | 20.58 | 25.88 | 26.55 | 27.43 | 27.89 | 27.66 | 30.80 | 22.84 | 26.82 | 27.11 | 27.66<br>n.r. | 27.38<br>n.r. | 27.10<br>n.r. | 26.82<br>n.r. |
| 1955 | 16.14 | 17.66 | 17.26 | 18.72 | 16.46 | 17.59 | 21.02 | 18.80 | 19.91 | 17.42 | 17.59<br>n.r. | 18.36<br>n.r. | 19.14<br>n.r. | 19.91<br>n.r. |
| 1956 | 19.84 | 11.99 | 14.05 | 12.71 | 18.17 | 15.44 | 14.27 | 22.02 | 18.14 | 14.74 | 15.44<br>n.r. | 16.34<br>n.r. | 17.24<br>n.r. | 18.14<br>n.r. |
| 1957 | 23.01 | 18.27 | 18.00 | 19.37 | 19.08 | 19.22 | 21.74 | 25.54 | 23.64 | 18.61 | 19.22 | 20.69 | 22.17 | 23.64 |

a/ Revised estimates made in February.

b/ Actual prices for first week of February; also taken as $p_2$.

c/ $p_4 = p_1 - 3(p_1 - p'_2)$.

d/ Lower values represent revised final estimates for May through July. Although the value for April appears, it is not effective since the computation is made at the beginning of May. No revisions are made unless all estimates for February, March, and April are biased in the same direction and the April bias is greater than $2.00. The revision for May, June, and July is a parallel extension of the previous estimates and is based on the actual price for April.

e/ N.r. means not revised.

FIGURE 35

Final and Revised Final Forecasts and Actual Monthly Average Prices for 200 to 220 Pound Choice Slaughter Hogs at Omaha (January-July)

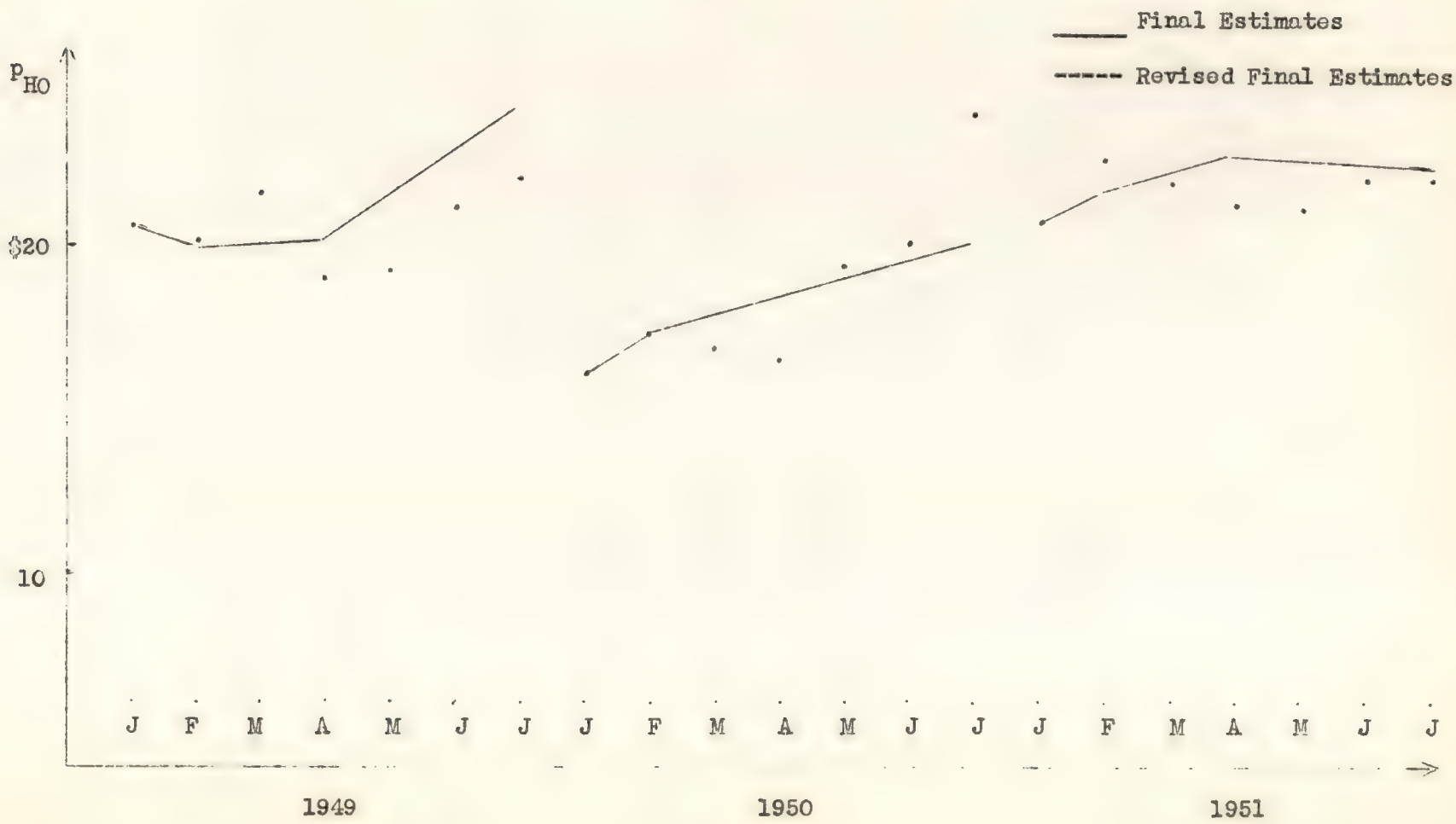


FIGURE 35 Continued

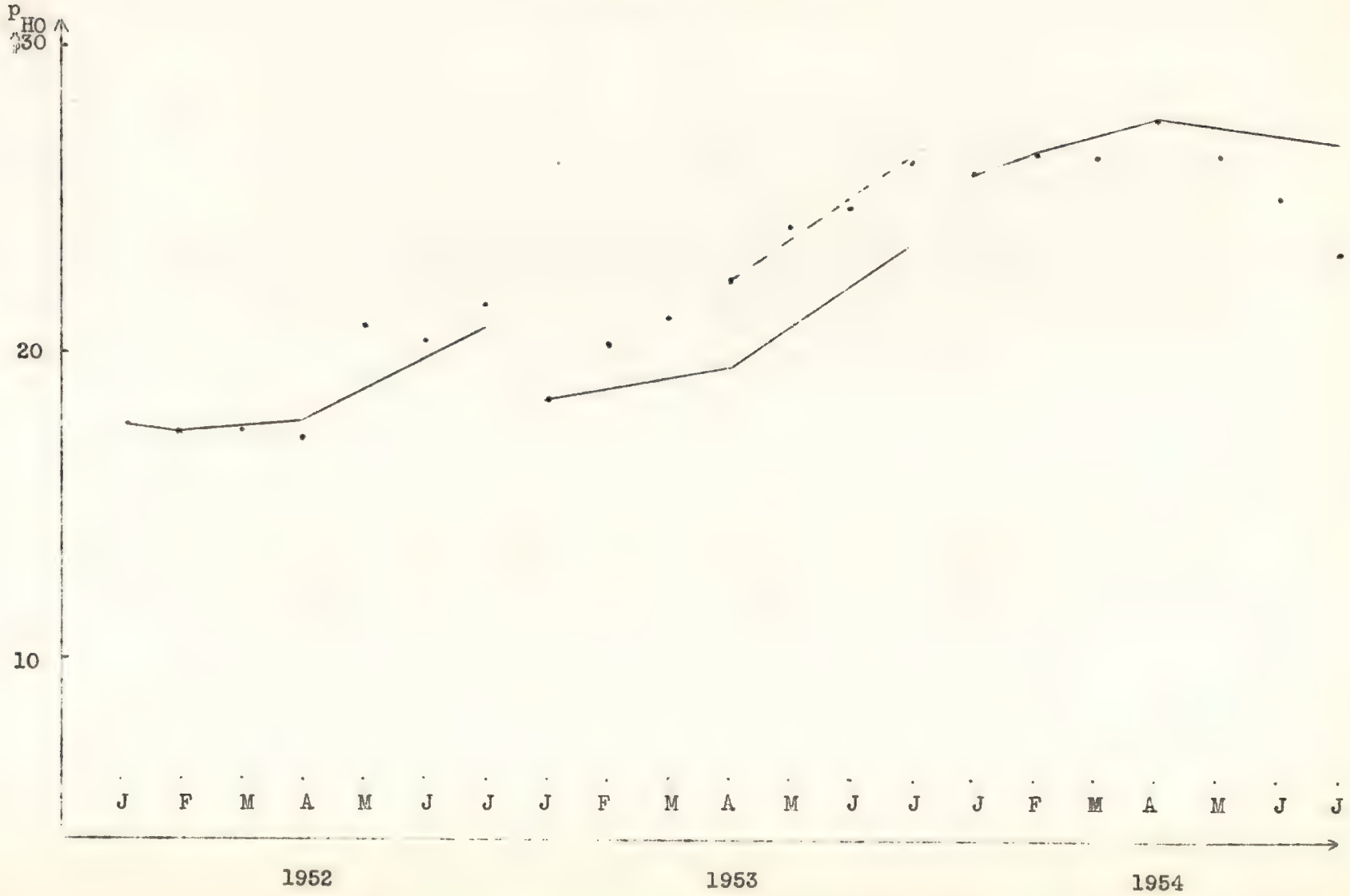
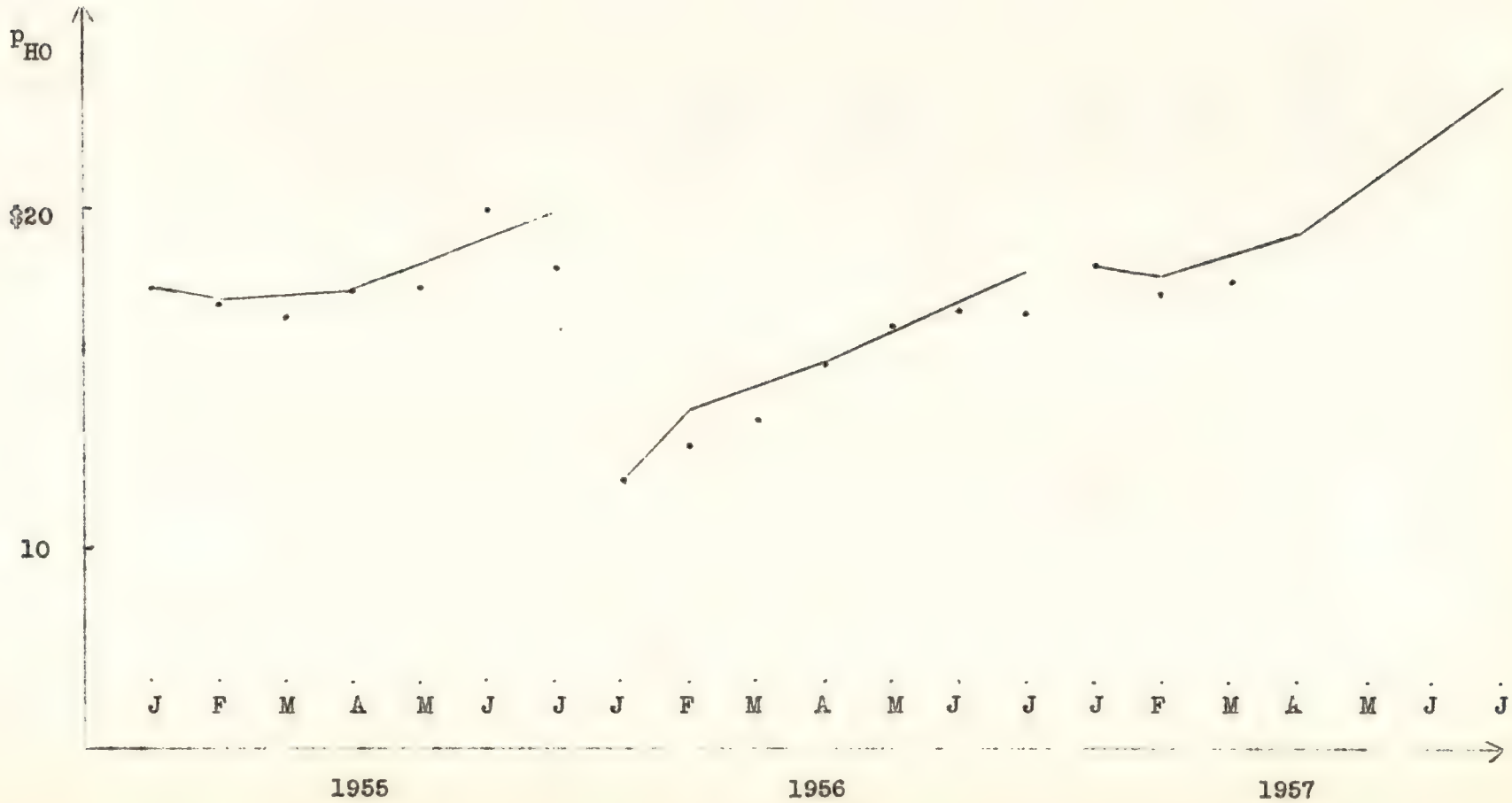


FIGURE 35 Continued



2. August Through December Period

Preliminary forecasts for cattle are given in Table 18 and on Figure 36. Normally, the total of the monthly average prices at Omaha for the August through December period is equal to 5.1 times the annual average price level. The principle employed in these preliminary forecasts is to estimate the August price and then forecast a linear sequence through December so that their sum is equal to 5.1 $P'_{BO}$. The August estimate is based on the final forecast for July through their relative indexes. The values headed by $\Delta$ are the monthly increments to add or subtract, sequentially, so that the above requirement is satisfied.

The revised forecasts for cattle are given in Table 19 and on Figure 36. The same basic principle is employed, namely, that the sum of the linear sequence of prices for August through December must equal a residual (not 5.1 $P'_{BO}$ now) consistent with the estimated annual average price and the prices that have developed during the early part of the year. At this time (early June), the May price is available as well as the average price for the first week of June (taken as an estimate for all of June) so that, if the July price could be estimated, one could employ equation 9 to estimate $P_{BO}$ by means of an estimated value for $\bar{P}_{BO,567}$. This is precisely what is done. Including the estimates for $p_6$ and $p_7$, the sum for the first seven months ($S'_7$) can be computed. The total for the year can be estimated as $12P'_{BO}$ and the residual for the last five months as $12P'_{BO} - S'_7$. The forecast of $p_8$ is based on $P'_{BO}$ and the increment, $\Delta$ , is computed so that $5p_8 + 10\,\Delta = R$.

The final forecasts for cattle are given in Table 20 and on Figure 37. The same general procedure is employed as for the revised

August Through December Period

Preliminary forecasts for cattle are given in Table 16 and on Figure 36. Generally, the trend of the monthly farmers prices of cattle for the August through December period is equal to $\$1.1$ times the usual average price level. The principle employed in these preliminary forecasts is to estimate the figures under the assumed $\$1.1$ more expensive through December so that their sum is equal to $\$1.1 \times 6$. The forecast estimates in terms of the final forecast for July through December indicate. The values in mind by $\hat{p}_t$ are the monthly movements to and or upward, respectively, as that the above monthly movements in action.

The monthly forecasts for cattle are given in Table 16 and on Figure 36. We suppose [illegible] of the linear regression of price for August through [illegible] a monthly [illegible] $\$1.1 \hat{p}_{t}$ now) corresponding with the seasonal [illegible] and one period [illegible] [illegible] the early part of the year. [illegible] (early June); the [illegible] is [illegible] for all of June; so then, if monthly prices could be estimated, one would [illegible] to generate $\hat{p}_{t}$ by means of an [illegible] [illegible]. This is precisely what is done. Including the estimates for $\hat{p}_{t}$ and $\hat{p}_{t}$, the one for the first seven months ($\hat{p}_{t}$) can be generated. The times for this year can be estimated as $\hat{p}_{t}$ and the residual for the last five months as $\hat{p}_{t} - \hat{p}_{t}$. The forecasts of $\hat{p}_{t}$ is based on $\hat{p}_{t}$ and the increment, $\hat{\delta}$, is generated so that $\hat{p}_{t} = (1)\hat{p}_{t} + \hat{\delta}$.

The final forecasts for cattle are given in Table 16 and on Figure 37. The same seasonal phenomena is analyzed as for the revised

forecasts. By early August a better estimate of $P_{BO}$ can be made and $S_7$ need not be estimated. The price for the first week of August ($p_8'$) is available and is given either partial or full weight in estimating $p_8$. Should $P_8'$ differ greatly from what would be expected in relation to $P_{BO}'$, then full weight is given to the former.

The preliminary forecasts for hogs are given in Table 21 and on Figure 38. The final estimate of $p_6$ is used as $\bar{p}_{HO,567}$ in equation 10 to forecast $P_{HO}'$. The forecast for $p_8$ is also based on the final forecast of $p_6$. A residual total for the last five months is estimated by $12P_{HO}' - S_7'$ is the sum of the final forecasts for January through July. The price sequence for August through December is linear through November with December being equated with November. Consequently, $\Delta$ is computed so that $5p_8 + 9\Delta = R$.

The revised forecasts for hogs are given in Table 22 and on Figure 38. The procedure parallels that given for cattle in Table 19 in most respects. The price for the first week of June ($p_6'$) is taken as an estimate of $\bar{p}_{HO,567}$ and is used in equation 10 to estimate $P_{HO}$. Forecasts for $p_7$ and $p_8$ are also based on $p_6'$ and the relative indexes. The residual total for the last five months is estimated by $12P_{HO}' - S_7'$ and $\Delta$ computed so that $5p_8 + 9\Delta = R$.

Final forecasts for hogs are given in Table 23 and on Figure 39. Two residual totals are estimated, namely, $4.88P_{HO}'$ and $12P_{HO}' - S_7$. The choice between the two is consistent with the relative sizes of $p_8$ and $1.12P_{HO}'$. After the selection of the consistent residual total, equal weight is given to the average price for the first week of August ($p_8'$) and $1.12P_{HO}'$ (the normal estimate of $p_8$) unless the $\Delta$ computed is smaller than -2.50. If the latter occurs, then $p_8'$ is given full weight as an estimate of $p_8$.

forecasts. By early August a better estimate of $F_{30}$ can be made and $S_7$ need not be estimated. The price for the first week of August ($p_8'$) is available and is given either partial or full weight in estimating $p_8$. Should $F_{30}'$ differ greatly from what would be expected in relation to $F_{30}''$, then full weight is given to the former.

The preliminary forecasts for hogs are given in Table 21 and on Figure 38. The final estimate of $p_6$ is used as $\bar{F}_{30}, S_{67}$ in equation 10 to forecast $F_{30}'$. The forecast for $p_8$ is also based on the final forecast of $p_6$. A residual total for the last five months is estimated by $12F_{30}' - S_7'$ is the sum of the final forecasts for January through July. The price sequence for August through December is linear through December with December being equated with November. Consequently, $\Delta$ is computed so that $5p_3 + 9\Delta = R$.

The revised forecasts for hogs are given in Table 22 and on Figure 39. The procedure parallels that given for cattle in Table 19 in most respects. The price for the first week of June ($p_5'$) is taken as an estimate of $\bar{F}_{30}, S_{67}$ and is used in equation 10 to estimate $\bar{F}_{30}$. Forecasts for $p_7$ and $p_8$ are also based on $p_5'$ and the relative indexes. The residual total for the last five months is estimated by $12F_{30}' - S_7'$ and $\Delta$ computed so that $5p_3 + 9\Delta = R$.

Final forecasts for hogs are given in Table 23 and on Figure 40. Two residual totals are estimated, namely, $1.9F_{30}'$ and $12F_{30}' - S_7'$. The choice between the two is consistent with the relative sizes of $p_8$ and $1.9F_{30}'$. Since the estimate of the [illegible] (June, July) weight is given to the average price for the first week of August ($p_8'$) and $1.9F_{30}'$ (the normal estimate of $p_8$) unless the $\Delta$ computed is smaller than $-2.5p_3$. If the latter occurs, then $p_8'$ is given full weight as an estimate of $p_8$.

TABLE 18

Preliminary Forecasts of August-December Monthly Average Prices for 900 to 1,100 Pound Choice Slaughter Steers at Omaha

| Year | $P'_{BO}$ a/ | $R = 5.1P'_{BO}$ | $p_7$ b/ | $p_8$ based on $p_7$ | $\Delta = \frac{R - 5p_8}{10}$ | $p_8$ | $p_9$ | $p_{10}$ | $p_{11}$ | $p_{12}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| | dollars | | | | | | | | | |
| 1949 | 29.51 | 150.50 | 26.32 | 26.85 | 1.62 | 26.85 | 28.47 | 30.09 | 31.71 | 33.33 |
| 1950 | 31.15 | 158.86 | 28.98 | 29.56 | 1.11 | 29.56 | 30.67 | 31.78 | 32.89 | 34.00 |
| 1951 | 31.34 | 159.83 | 31.90 | 32.54 | - .29 | 32.54 | 32.25 | 31.96 | 31.67 | 31.38 |
| 1952 | 29.18 | 148.82 | 30.62 | 31.23 | - .73 | 31.23 | 30.50 | 29.77 | 29.04 | 28.31 |
| 1953 | 25.81 | 131.63 | 25.66 | 26.17 | .08 | 26.17 | 26.25 | 26.33 | 26.41 | 26.49 |
| 1954 | 22.70 | 115.77 | 22.29 | 22.74 | .21 | 22.74 | 22.95 | 23.16 | 23.37 | 23.58 |
| 1955 | 22.86 | 116.59 | 24.20 | 24.68 | - .68 | 24.68 | 24.00 | 23.32 | 22.64 | 21.96 |
| 1956 | 24.11 | 122.96 | 21.40 | 21.83 | 1.38 | 21.83 | 23.21 | 24.59 | 25.97 | 27.35 |
| 1957 | 24.85 | 126.74 | 22.12 | 22.56 | 1.39 | 22.56 | 23.95 | 25.34 | 26.73 | 28.12 |

a/ Revised estimates of $P_{BO}$ made in February.

b/ Final estimates of $p_7$ made in February.

TABLE 19

Revised Forecasts of August-December Monthly Average Prices for 900 to 1,100 Pound Choice Slaughter Steers at Omaha

| Year | $p_4$ | $p_5$ | $p_6'$ a/ | $p_7$ based on $p_4$ and $p_6'$ b/ | $S_7' = \sum_{i=1}^{7} p_i$ c/ | $\bar{p}_{567}$ d/ | $P_{BO}'$ based on $\bar{p}_{567}$ e/ | $R = 12P_{BO}' - S_7'$ | $\Delta = \frac{R - 5p_8}{10}$ | $p_8$ f/ | $p_9$ | $p_{10}$ | $p_{11}$ | $p_{12}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dollars | | | | | | | | | | | | | |
| 1949 | 23.74 | 24.30 | 25.56 | 26.47 | 171.29 | 25.44 | 26.22 | 143.35 | 1.22 | 26.22 | 27.44 | 28.66 | 29.88 | 31.10 |
| 1950 | 27.24 | 28.66 | 29.50 | 30.63 | 199.37 | 29.60 | 29.94 | 159.91 | 1.02 | 29.94 | 30.96 | 31.98 | 33.00 | 34.02 |
| 1951 | 36.36 | 35.41 | 34.75 | 33.96 | 246.86 | 34.71 | 34.52 | 167.38 | - .52 | 34.52 | 34.00 | 33.48 | 32.96 | 32.44 |
| 1952 | 33.73 | 33.08 | 32.18 | 31.41 | 233.13 | 32.22 | 32.29 | 154.35 | - .71 | 32.29 | 31.58 | 30.87 | 30.16 | 29.45 |
| 1953 | 21.19 | 21.73 | 21.22 | 21.24 | 159.48 | 21.40 | 22.60 | 111.72 | - .13 | 22.60 | 22.47 | 22.34 | 22.21 | 22.08 |
| 1954 | 23.90 | 23.14 | 23.28 | 22.97 | 163.79 | 23.13 | 24.15 | 126.01 | .53 | 24.15 | 24.68 | 25.21 | 25.74 | 26.27 |
| 1955 | 24.32 | 22.20 | 22.06 | 20.93 | 168.53 | 21.73 | 22.89 | 106.15 | - .83 | 22.89 | 22.06 | 21.23 | 20.40 | 19.57 |
| 1956 | 20.28 | 20.26 | 20.45 | 20.54 | 141.31 | 20.42 | 21.72 | 119.33 | 1.07 | 21.72 | 22.79 | 23.86 | 24.93 | 26.00 |

a/ Actual prices for first week of June; also taken as estimates for $p_6$.

b/ Linear extrapolation based on $p_4$ and $p_6'$.

c/ $p_1 + p_2 + p_3 + p_4 + p_5 + p_6 + p_{7(\text{based on } p_4 \text{ and } p_6')}$.

d/ $1/3(p_5 + p_6 + p_{7(\text{based on } p_4 \text{ and } p_6')})$.

e/ Based on using $p_{567}$ in equation 9.

f/ $p_8$ is based on $P_{BO}'$ based on $\bar{p}_{567}$.

TABLE 15

Low-end Forecasts of August-December Monthly Average Prices
For 900 to 1,100 Pound Ohioto Steelhead Stores at Omaha

| Year | $p_1$ | $p_2$ | $p_3$ | $p_4$ | $p_5$ | $p_6$ | $p_7$ | $p_8$ | $p_9$ | $p_{10}$ | $p_{11}$ | $p_{12}$ | $p_{13}$ | $p_{14}$ | $p_{15}$ | $p_{16}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1949 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 1.04 | 26.22 | [illegible] | [illegible] | [illegible] |
| 1950 | [illegible] | [illegible] | [illegible] | [illegible] | 1[illegible].37 | 29.66 | [illegible] | [illegible] | 1[illegible].71 | 1.02 | 29.91 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 1951 | [illegible] | [illegible] | [illegible] | [illegible] | 246.36 | 34.71 | 34.42 | 1[illegible].38 | - .52 | 24.32 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 1952 | [illegible] | [illegible] | [illegible] | [illegible] | 243.13 | 32.22 | 32.07 | 1[illegible].35 | - .71 | 25.25 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 1953 | [illegible] | [illegible] | [illegible] | [illegible] | 1[illegible].49 | 21.80 | 22.60 | 121.72 | - .13 | 20.60 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 1954 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 23.66 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 1955 | [illegible] | [illegible] | [illegible] | [illegible] | 1[illegible].53 | 21.73 | 22.69 | 106.15 | - .11 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 1956 | [illegible] | [illegible] | [illegible] | [illegible] | 1[illegible].32 | 20.42 | 21.78 | 1[illegible].32 | [illegible] | [illegible] | 23.78 | 23.86 | [illegible] | [illegible] | [illegible] | [illegible] |

1/ Actual prices for first week of June; also taken as minimum for $p_1$.

2/ Direct extrapolation based on $p_1$ and $p_2$.

3/ $p_1 + p_2 + p_3 + p_4 + p_5 + p_6 + p_7$ (based on $p_1$ and $p_2$).

4/ $p_3 + p_4 + p_5$ (based on $p_1$ and $p_2$).

5/ Based on using $p_{12}$ in substitution $p_5$.

6/ $p_{13}$ is final on $p_1$ based on $p_{12}$.

FIGURE 36

Preliminary and Revised Forecasts and Actual Monthly Average Prices for 900 to 1,100 Pound Choice Slaughter Steers at Omaha (August-December)

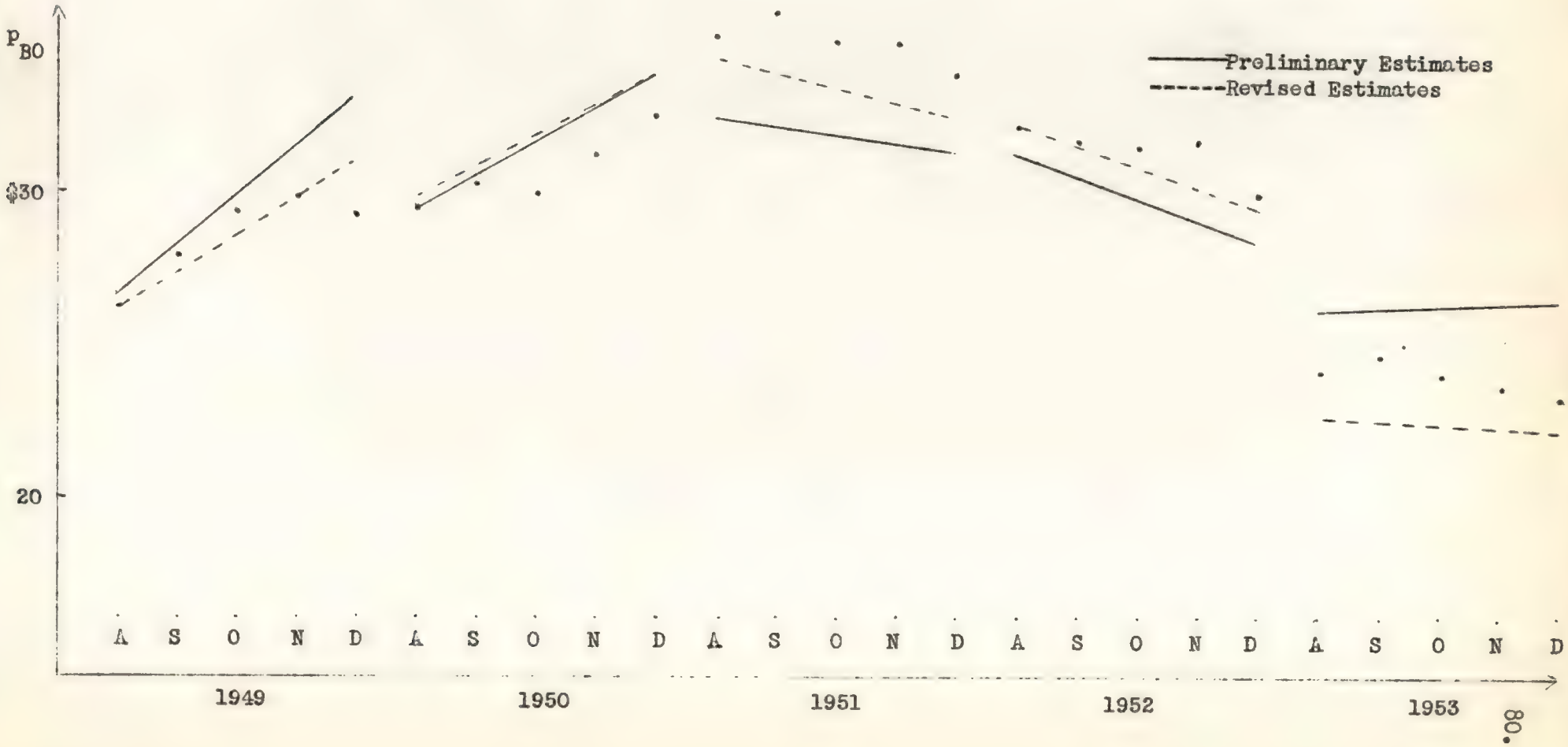


FIGURE 36 Continued

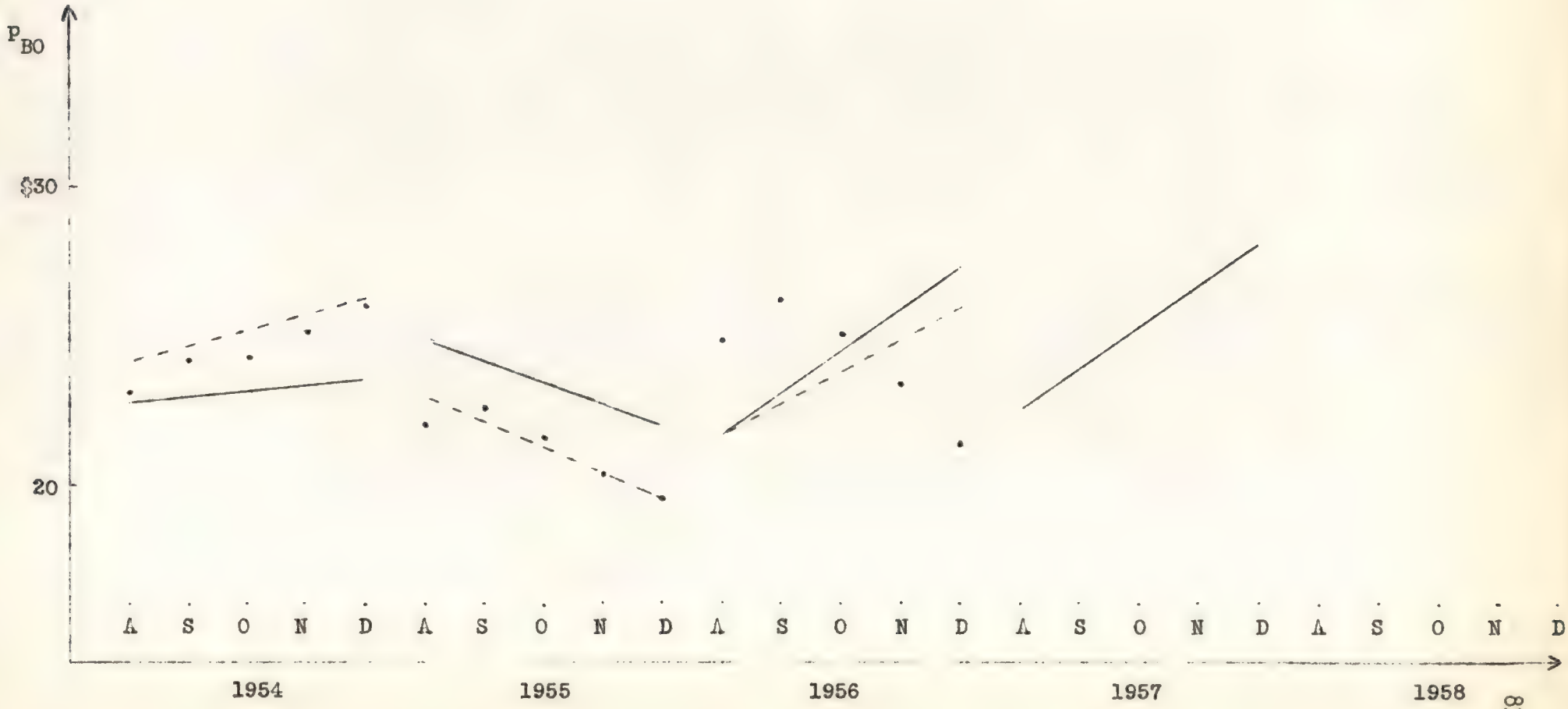


TABLE 20

Final Forecasts of August-December Monthly Average Prices for 900 to 1,100 Pound Choice Slaughter Steers at Omaha

| Year | $P'_{BO}$ a/ | $12P'_{BO}$ | $S_7 = \sum_{i=1}^{7} p_i$ | $R = 12P'_{BO} - S_7$ | $5p_8$ | $\Delta = \frac{R - 5p_8}{10}$ | $\bar{p} = \frac{p'_8 + P'_{BO}}{2}$ | $p_8$ b/ | $p_9$ | $p_{10}$ | $p_{11}$ | $p_{12}$ | $p'_8$ c/ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dollars | | | | | | | | | | | | |
| 1949 | 26.05 | 312.60 | 170.73 | 141.87 | 129.80 | 1.21 | 25.96 | 25.96 | 27.17 | 28.38 | 29.59 | 30.80 | 25.88 |
| 1950 | 29.63 | 355.56 | 198.32 | 157.24 | 148.40 | .88 | 29.68 | 29.68 | 30.56 | 31.44 | 32.32 | 33.20 | 29.72 |
| 1951 | 34.77 | 417.24 | 247.70 | 169.54 | 174.70 | - .52 | 34.94 | 34.94 | 34.42 | 33.90 | 33.38 | 32.86 | 35.10 |
| 1952 | 32.43 | 389.16 | 233.61 | 155.55 | 161.00 | - .55 | 32.20 | 32.20 | 31.65 | 31.10 | 30.55 | 30.00 | 31.98 |
| 1953 | 23.16 | 277.92 | 161.37 | 116.55 | 118.65 | - .21 | 23.73 | 23.73 | 23.52 | 23.31 | 23.10 | 22.89 | 24.30 |
| 1954 | 23.76 | 285.12 | 162.50 | 122.62 | 115.50 | .71 | 23.10 | 23.10 | 23.81 | 24.52 | 25.23 | 25.94 | 22.45 |
| 1955 | 23.21 | 278.52 | 169.61 | 108.91 | 112.10 | - .32 | 22.42 | 22.42 | 22.10 | 21.78 | 21.46 | 21.14 | 21.62 |
| 1956 | 22.19 | 266.28 | 142.86 | 123.42 | 121.00 | .24 | 23.20 | 24.20 | 24.44 | 24.68 | 24.92 | 25.16 | 24.20 |

a/ Final estimates (2).

b/ $p_8$ is taken as $\bar{p}$ if $|p'_8 - P'_{BO}| < \$1.75$; otherwise $p_8 = p'_8$.

c/ $p'_8$ is the weekly average price for the first effective week of August.

FIGURE 37

Final Forecasts and Actual Monthly Average Prices
for 900 to 1,100 Pound Choice Slaughter Steers at Omaha (August-December)

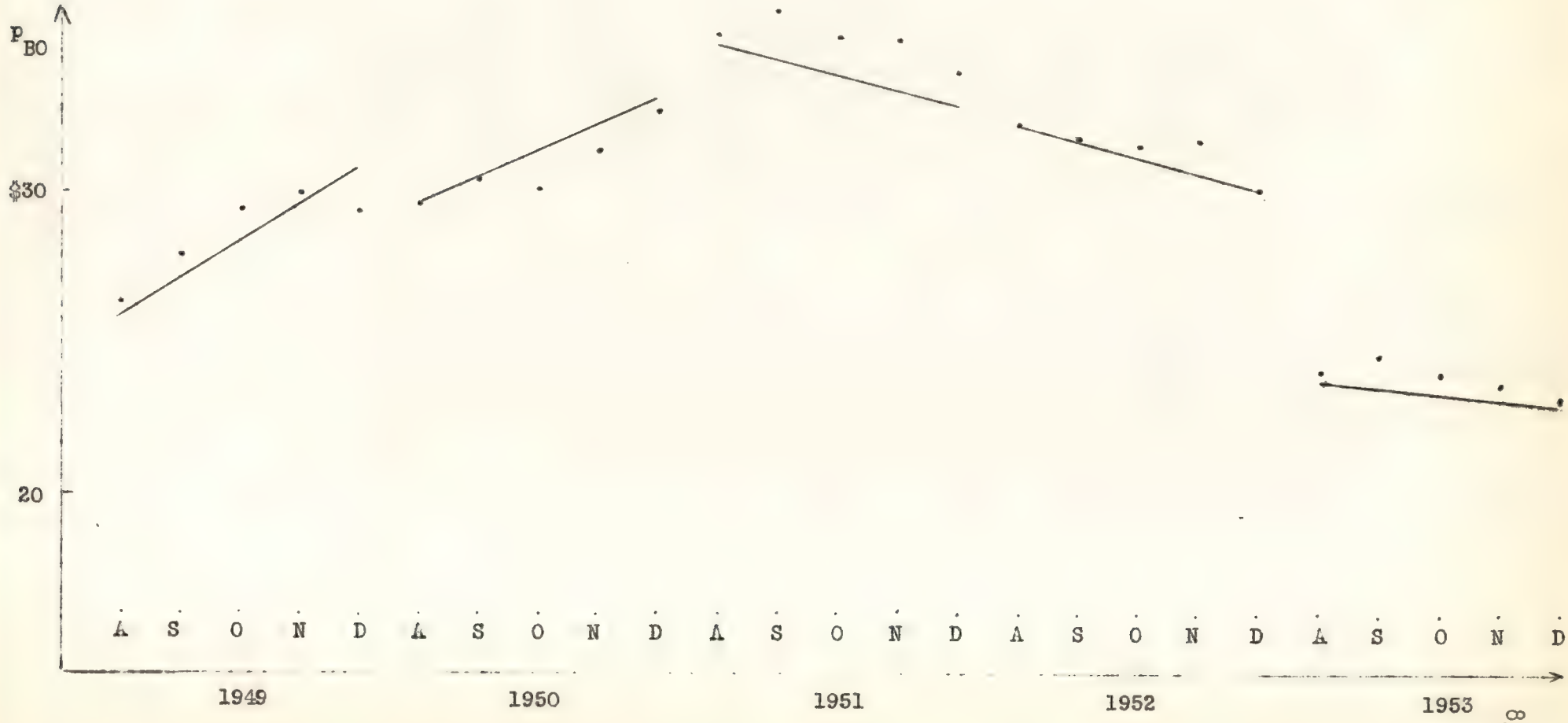


FIGURE 37 Continued

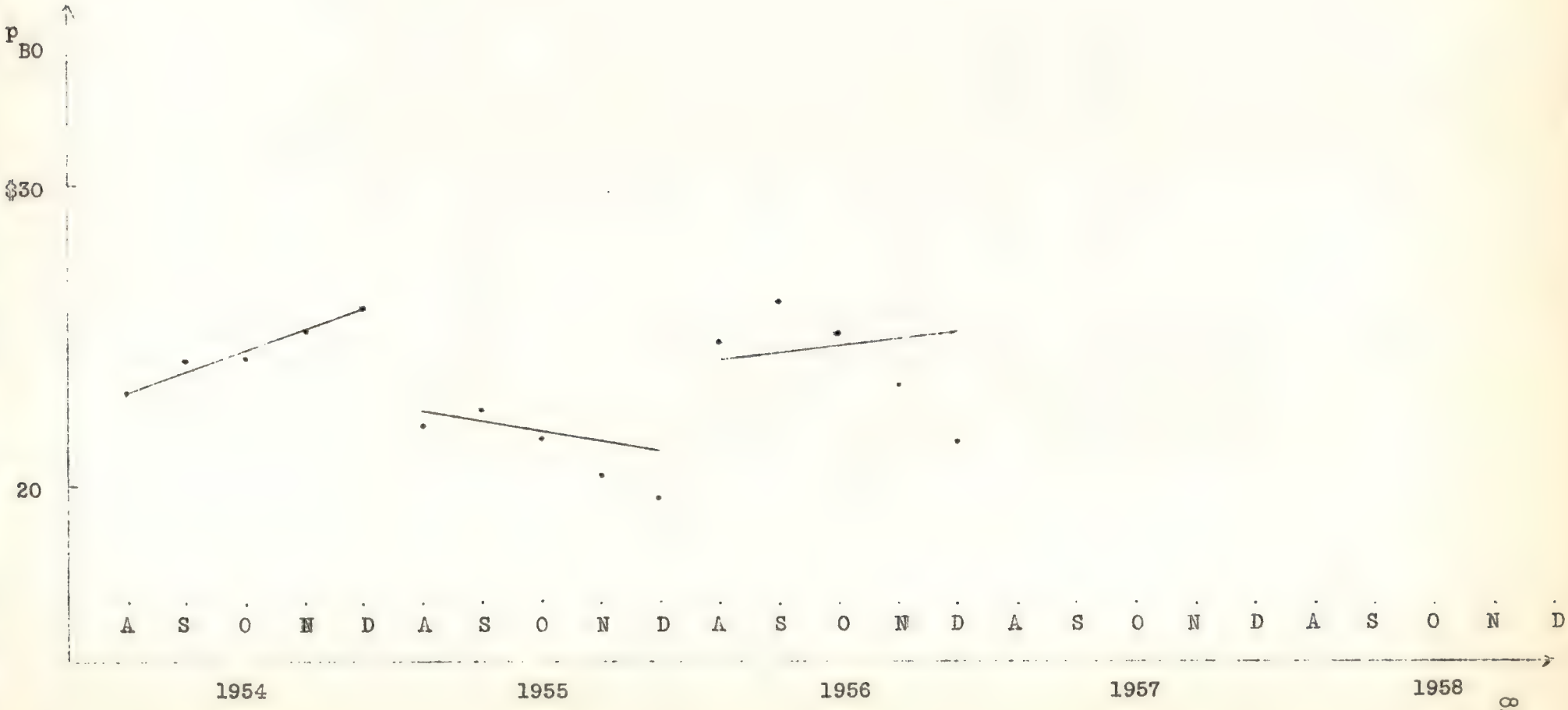


TABLE 21

Preliminary Forecasts of August-December Monthly Average Prices for 200 to 220 Pound Choice Slaughter Hogs at Omaha

| Year | $p_6$ a/ | $P'_{HO}$ based on $p_6$ b/ | $12P'_{HO}$ | $S'_7 = \sum_{i=1}^{7} p_i$ c/ | $12P'_{HO} - S'_7$ | $p_8$ based on $p_6$ | $\Delta = \frac{R - 5p_8}{9}$ | $p_8$ | $p_9$ | $p_{10}$ | $p_{11}$ | $p_{12}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dollars | | | | | | | | | | | |
| 1949 | 22.91 | 21.11 | 253.32 | 149.52 | 103.80 | 23.60 | -1.58 | 23.60 | 22.02 | 20.44 | 18.86 | 18.86 |
| 1950 | 19.54 | 17.69 | 212.28 | 128.22 | 84.06 | 20.13 | -1.84 | 20.13 | 18.29 | 16.45 | 14.61 | 14.61 |
| 1951 | 22.55 | 20.74 | 248.88 | 155.17 | 93.71 | 23.23 | -2.49 | 23.23 | 20.74 | 18.25 | 15.76 | 15.76 |
| 1952 | 19.82 | 17.98 | 215.76 | 129.00 | 86.76 | 20.41 | -1.70 | 20.41 | 18.71 | 17.01 | 15.31 | 15.31 |
| 1953 | 22.18 | 20.37 | 244.44 | 142.19 | 102.25 | 22.85 | -1.33 | 22.85 | 21.52 | 20.19 | 18.86 | 18.86 |
| 1954 | 27.10 | 25.34 | 304.08 | 188.50 | 115.58 | 27.91 | -2.50 d/ | 27.91 | 25.41 | 22.91 | 20.41 | 20.41 |
| 1955 | 19.14 | 17.29 | 207.48 | 127.34 | 80.14 | 19.71 | -2.05 | 19.71 | 17.66 | 15.61 | 13.56 | 13.56 |
| 1956 | 17.24 | 15.37 | 184.44 | 107.94 | 76.50 | 17.76 | -1.37 | 17.76 | 16.39 | 15.02 | 13.65 | 13.65 |
| 1957 | 22.17 | 20.36 | 244.32 | 140.60 | 103.72 | 22.84 | -1.16 | 22.84 | 21.68 | 20.52 | 19.36 | 19.36 |

a/ Final estimates made in February of given year.

b/ $p_6$ is used in equation 10 as an estimate of $\bar{p}_{567}$ since $p_5$, $p_6$, and $p_7$, as estimated, lie on a straight line.

c/ $S'_7$ is the sum of the January-July final estimates.

d/ Whenever $\Delta$, as computed, is less than -2.50, then $\Delta = -2.50$ is used.

TABLE 22

Revised Forecasts of August-December Monthly Average Prices for 200 to 220 Pound Choice Slaughter Hogs at Omaha

| Year | $p_6'$ a/ | $P_{HO}'$ based on $p_6'$ b/ | $p_7$ based on $p_6'$ | $p_8$ based on $p_6'$ | $12P_{HO}'$ | $S_7'$ $\sum_{i=1}^{7} p_i$ c/ | $R = 12P_{HO}' - S_7'$ | $\Delta = \frac{R - 5p_8}{9}$ | $p_8$ | $p_9$ | $p_{10}$ | $p_{11}$ | $p_{12}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dollars | | | | | | | | | | | | |
| 1949 | 21.91 | 20.09 | 22.35 | 22.58 | 241.08 | 144.80 | 96.28 | -1.85 | 22.58 | 20.73 | 18.88 | 17.03 | 17.03 |
| 1950 | 19.78 | 17.94 | 20.18 | 20.37 | 215.28 | 126.02 | 89.26 | -1.40 | 20.37 | 18.97 | 17.57 | 16.17 | 16.17 |
| 1951 | 21.50 | 19.68 | 21.93 | 22.14 | 236.16 | 151.33 | 84.83 | -2.50 d/ | 22.14 | 19.64 | 17.14 | 14.64 | 14.64 |
| 1952 | 20.60 | 18.77 | 21.01 | 21.22 | 225.24 | 132.12 | 93.12 | -1.44 | 21.22 | 19.78 | 18.34 | 16.90 | 16.90 |
| 1953 | 25.05 | 23.27 | 25.55 | 25.80 | 279.24 | 156.82 | 122.42 | - .73 | 25.80 | 25.07 | 24.34 | 23.61 | 23.61 |
| 1954 | 26.12 | 24.35 | 26.64 | 26.90 | 292.20 | 185.67 | 106.53 | -2.50 d/ | 26.90 | 24.40 | 21.90 | 19.40 | 19.40 |
| 1955 | 18.78 | 16.93 | 19.16 | 19.34 | 203.16 | 124.70 | 78.46 | -2.03 | 19.34 | 17.31 | 15.28 | 13.25 | 13.25 |
| 1956 | 17.32 | 15.46 | 17.67 | 17.84 | 185.52 | 105.47 | 80.05 | -1.02 | 17.84 | 16.82 | 15.80 | 14.78 | 14.78 |

a/ Actual prices for first effective week of June.

b/ $p_6'$ is used in equation 10 as an estimate of $\bar{p}_{567}$.

c/ $S_7' = (p_1 + p_2 + p_3 + p_4 + p_5 + p_6 + p_{7(\text{based on } p_6')})$.

d/ If $\Delta$ is less than -2.50 when computed, then $\Delta$ = -2.50 is used.

Table 32

Derived Financial and Accounting Data, Twenty-Year Plan
for 270 to 330 Pound Chinook Slaughter Hogs at Chicago

| Item | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1000 | 34.94 | 10.00 | [illegible] | 26.34 | 241.00 | [illegible] | 96.65 | -1.85 | [illegible] | [illegible] | [illegible] | 17.05 | 17.05 |
| 1000 | 49.40 | [illegible] | [illegible] | 40.37 | 245.26 | 124.02 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 16.17 |
| [illegible] | [illegible] | [illegible] | [illegible] | 24.11 | 236.46 | 125.23 | 84.51 | -0.5[illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | -1.0 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 270.24 | 152.32 | 122.42 | - .75 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 292.20 | 186.67 | 106.52 | -2.05 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 203.16 | 124.70 | 72.46 | -2.03 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 285.32 | 169.17 | 96.65 | -1.02 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

a/ Actual prices for first effective week of June.

b/ $P_1^1$ is used in equation 10 as an estimate of $\bar{P}_{1-1}$.

c/ $C_1^1 = (P_1 + P_2 + P_3 + P_4 + P_5 + P_6 + P_7$(based on $P_6^1$)).

d/ If $\Delta$ is less than -2.50 when computed, then $\Delta$ = -2.50 is used.

FIGURE 38

Preliminary and Revised Forecasts and Actual Monthly Average Prices for 200 to 220 Pound Choice Slaughter Hogs at Omaha (August-December)

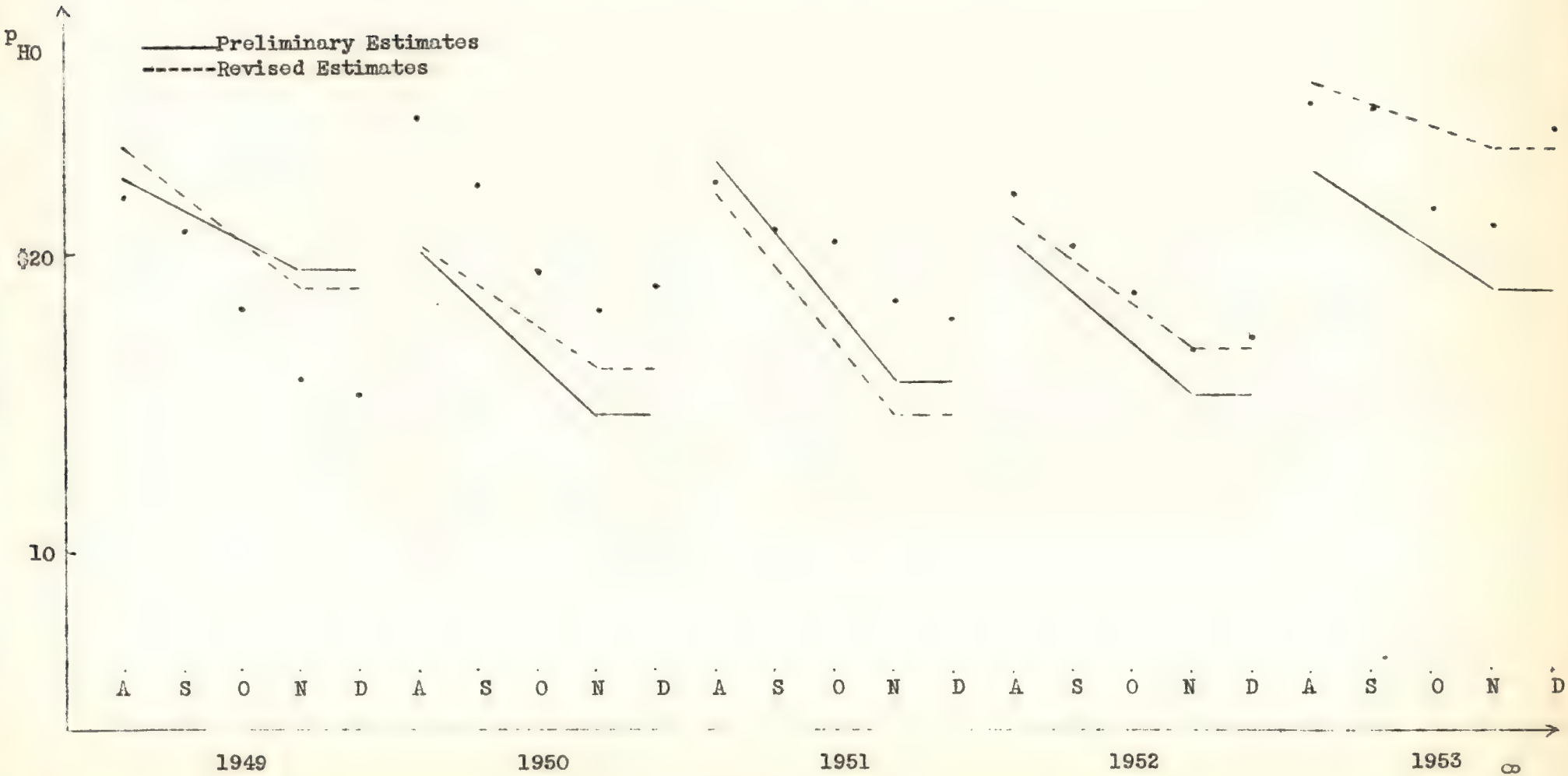


FIGURE 38 Continued

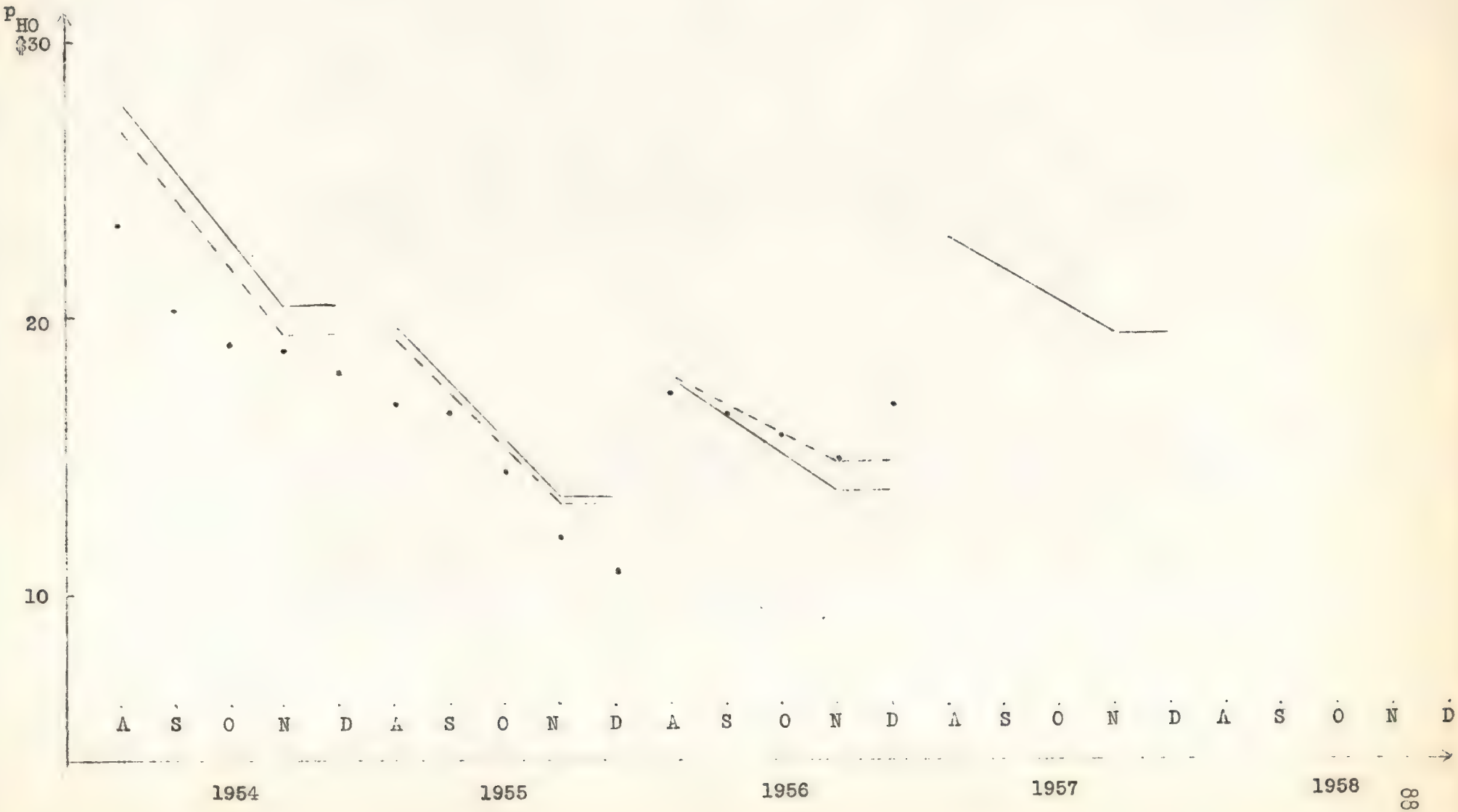


TABLE 23

Final Forecasts of August-December Monthly Average Prices for 200 to 220 Pound Choice Slaughter Hogs at Omaha

| Year | $P'_{HO}$ a/ | $12P'_{HO}$ | $S_7$ $\sum_{i=1}^{7} p_i$ | $R = 12P'_{HO} - S_7$ | $\bar{R} = 4.88P'_{HO}$ | $\bar{p} = \frac{p'_8 + 1.12P'_{HO}}{2}$ | $\Delta = \frac{R' - 5p'}{9}$ b/ | $p_8$ c/ | $p_9$ | $p_{10}$ | $p_{11}$ | $p_{12}$ | $p'_8$ | $1.12P'_{HO}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dollars | | | | | | | | | | | | | |
| 1949 | 18.98 | 227.76 | 143.76 | 84.00 | 92.62 | 21.97 | -1.91 | 21.97 | 20.06 | 18.15 | 16.24 | 16.24 | 22.68 | 21.26 |
| 1950 | 19.35 | 232.20 | 130.21 | 101.99 | 94.43 | 22.92 | -1.40 | 22.92 | 21.52 | 20.12 | 18.72 | 18.72 | 24.18 | 21.67 |
| 1951 | 19.93 | 239.16 | 151.99 | 87.17 | 97.26 | 22.56 | -1.73 | 22.56 | 20.83 | 19.10 | 17.37 | 17.37 | 22.81 | 22.32 |
| 1952 | 19.08 | 228.96 | 132.45 | 96.51 | 93.11 | 22.13 | -1.57 | 22.13 | 20.56 | 18.99 | 17.42 | 17.42 | 22.89 | 21.37 |
| 1953 | 23.28 | 279.36 | 157.24 | 122.12 | 113.61 | 25.72 | -1.67 | 25.72 | 24.05 | 22.38 | 20.71 | 20.71 | 25.38 | 26.07 |
| 1954 | 23.15 | 277.80 | 181.17 | 96.63 | 112.97 | 24.58 | -2.16 | 23.22 | 21.06 | 18.90 | 16.74 | 16.74 | 23.22 | 25.93 |
| 1955 | 16.74 | 200.88 | 124.91 | 75.97 | 81.69 | 17.46 | -1.26 | 17.46 | 16.20 | 14.94 | 13.68 | 13.68 | 16.18 | 18.75 |
| 1956 | 14.91 | 178.92 | 104.35 | 74.57 | 72.76 | 16.96 | -1.14 | 16.97 | 15.83 | 14.69 | 13.55 | 13.55 | 17.22 | 16.70 |

a/ Final estimates (2).

b/ $R'$ is larger or smaller of $R$ or $\bar{R}$ depending on whether $p'_8$ is greater or smaller than $1.12P'_{HO}$. Furthermore, $p' = \bar{p}$ unless $|\Delta| > 2.50$; otherwise, $p' = p'_8$. $p'_8$ is the actual average price for the first week of August.

c/ $p_8 = p'$.

FIGURE 39

Final Forecasts and Actual Monthly Average Prices
for 200 to 220 Pound Choice Slaughter Hogs at Omaha (August-December)

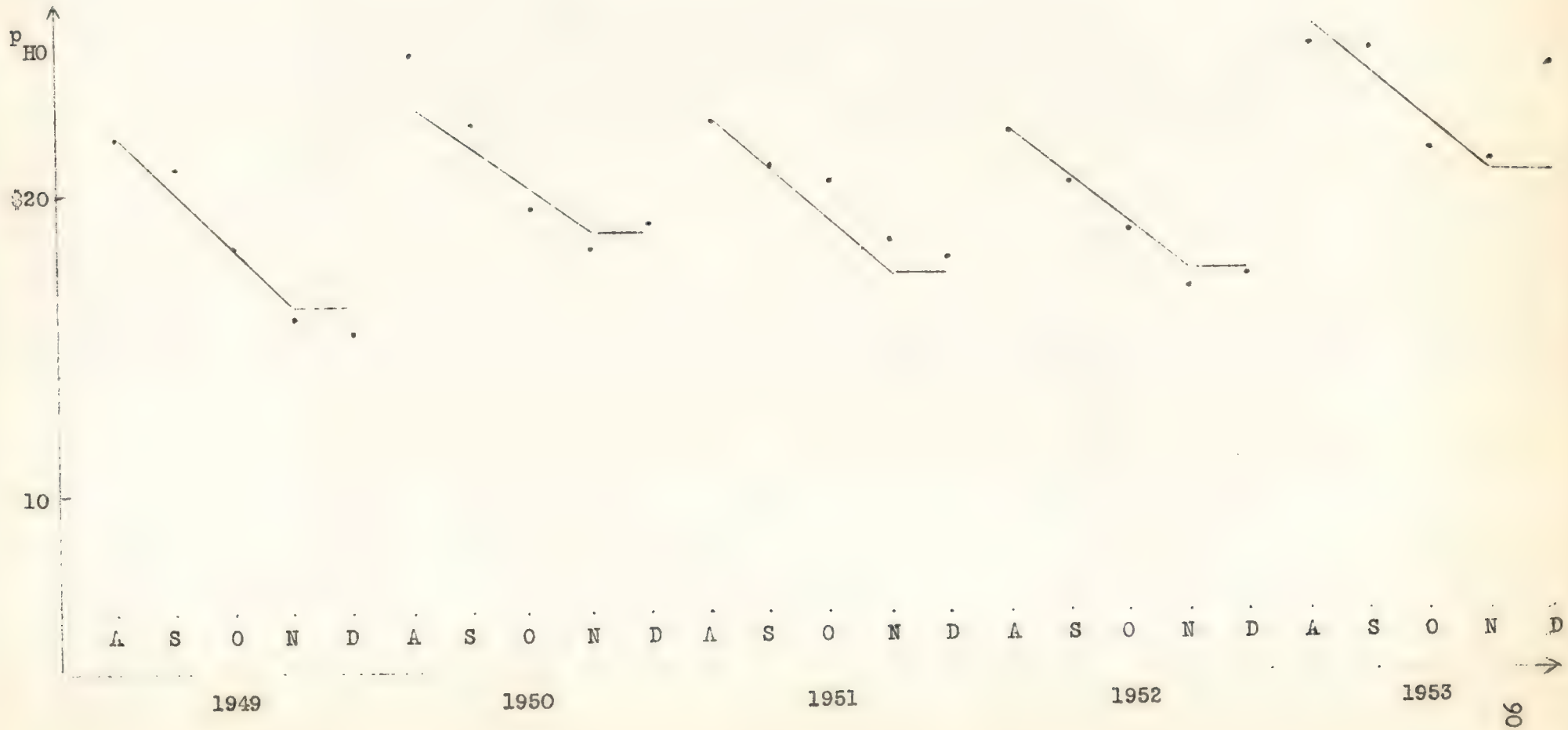
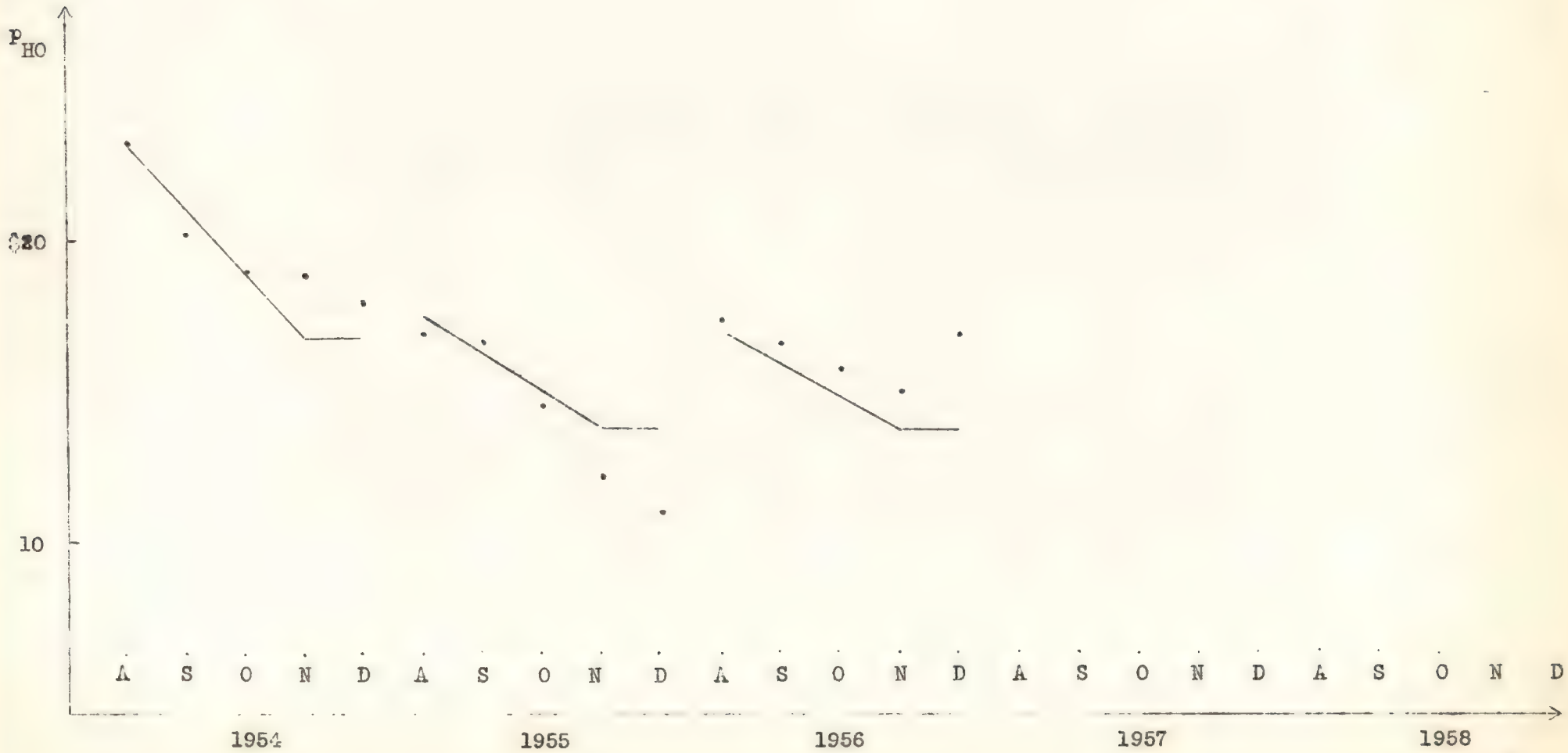


FIGURE 39 Continued



C. Los Angeles Market

The computations, tables, and figures underlying the forecasts for the Los Angeles market parallel comparable data for the Omaha markets so no specific discussion will be given. The only differences lie in separate indexes of seasonal variation, prices as of the first week of specific months, equations relating annual price levels to monthly price levels, and estimates of the annual average prices. To guide the reader on these paralleling aspects the following listing is provided.

| Omaha Market | Los Angeles Market |
|---|---|
| Table 14<br>Figure 32 | Table 24<br>Figure 40 |
| Table 15<br>Figure 33 | Table 25<br>Figure 41 |
| Table 16<br>Figure 34 | Table 26<br>Figure 42 |
| Table 17<br>Figure 35 | Table 27<br>Figure 43 |
| Table 18<br>Table 19<br>Figure 36 | Table 28<br>Table 29<br>Figure 44 |
| Table 20<br>Figure 37 | Table 30<br>Figure 45 |
| Table 21<br>Table 22<br>Figure 38 | Table 31<br>Table 32<br>Figure 46 |
| Table 23<br>Figure 39 | Table 33<br>Figure 47 |

TABLE 24

Preliminary and Revised Forecasts of January-July Monthly Average Prices for 900 to 1,100 Pound Choice Slaughter Steers at Los Angeles

| Year | $P'_{BLA}$ a/ | $p_{12}$ b/ | $p_1$ based on $p_{12}$ | $p_4$ based on $p_{12}$ | $p_7$ based on $p_{12}$ | $p_7$ based on $P'_{BLA}$ | $p_7$ average | $p_1$ c/ | $p_2$ c/ | $p_3$ c/ | $p_4$ c/ | $p_5$ c/ | $p_6$ c/ | $p_7$ c/ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dollars | | | | | | | | | | | | | |
| 1950 | 29.06 | 27.10 | 26.83 | 26.83 | 27.37 | 29.35 | 28.36 | 26.83 | 26.83 | 26.83 | 26.83 | 27.34 | 27.85 | 28.36 |
| | 29.06 | 26.25 | 25.99 | 25.99 | 26.51 | 29.35 | 27.93 | 25.99 | 25.99 | 25.99 | 25.99 | 26.64 | 27.28 | 27.93 |
| 1951 | 29.02 | 33.07 | 32.74 | 32.74 | 33.40 | 29.31 | 31.36 | 32.74 | 32.74 | 32.74 | 32.74 | 32.28 | 31.82 | 31.36 |
| | 29.02 | 31.75 | 31.43 | 31.43 | 32.08 | 29.31 | 30.70 | 31.43 | 31.43 | 31.43 | 31.43 | 31.19 | 30.94 | 30.70 |
| 1952 | 26.69 | 33.41 | 33.08 | 33.08 | 33.74 | 26.96 | 30.35 | 33.08 | 33.08 | 33.08 | 33.08 | 32.17 | 31.26 | 30.35 |
| | 26.69 | 35.85 | 35.49 | 35.49 | 36.21 | 26.96 | 31.58 | 35.49 | 35.49 | 35.49 | 35.49 | 34.19 | 32.88 | 31.58 |
| 1953 | 25.80 | 27.26 | 26.99 | 26.99 | 27.53 | 25.86 | 26.70 | 26.99 | 26.99 | 26.99 | 26.99 | 26.89 | 26.80 | 26.70 |
| | 25.80 | 29.00 | 28.71 | 28.71 | 29.29 | 25.86 | 27.58 | 28.71 | 28.71 | 28.71 | 28.71 | 28.33 | 27.96 | 27.58 |
| 1954 | 23.17 | 21.14 | 20.93 | 20.93 | 21.35 | 23.40 | 22.38 | 20.93 | 20.93 | 20.93 | 20.93 | 21.41 | 21.90 | 22.38 |
| | 23.17 | 23.50 | 23.26 | 23.26 | 23.74 | 23.40 | 23.57 | 23.26 | 23.26 | 23.26 | 23.26 | 23.36 | 23.47 | 23.57 |
| 1955 | 23.86 | 23.88 | 23.64 | 23.64 | 24.12 | 24.10 | 24.11 | 23.64 | 23.64 | 23.64 | 23.64 | 23.80 | 23.95 | 24.11 |
| | 23.86 | 23.00 | 22.77 | 22.77 | 23.23 | 24.10 | 23.66 | 22.77 | 22.77 | 22.77 | 22.77 | 23.07 | 23.36 | 23.66 |
| 1956 | 24.91 | 21.39 | 21.18 | 21.18 | 21.60 | 25.16 | 23.38 | 21.18 | 21.18 | 21.18 | 21.18 | 21.91 | 22.65 | 23.38 |
| | 24.91 | 20.00 | 19.80 | 19.80 | 20.20 | 25.16 | 22.68 | 19.80 | 19.80 | 19.80 | 19.80 | 20.76 | 21.72 | 22.68 |
| 1957 | 25.08 | 21.72 | 21.50 | 21.50 | 21.94 | 25.33 | 23.64 | 21.50 | 21.50 | 21.50 | 21.50 | 22.21 | 22.93 | 23.64 |
| | 25.08 | 21.00 | 20.79 | 20.79 | 21.21 | 25.33 | 23.27 | 20.79 | 20.79 | 20.79 | 20.79 | 21.62 | 22.44 | 23.27 |

a/ Preliminary estimates made in August of preceding year.

b/ Final estimates of $p_{12}$ for previous year (upper). Actual prices for first week of December (lower).

c/ Upper values are preliminary estimates made in August of preceding year. Lower values are revised estimates made in December of preceding year.

FIGURE 40

Preliminary and Revised Forecasts and Actual Monthly Average Prices
for 900 to 1,100 Pound Choice Slaughter Steers at Los Angeles (January-July)

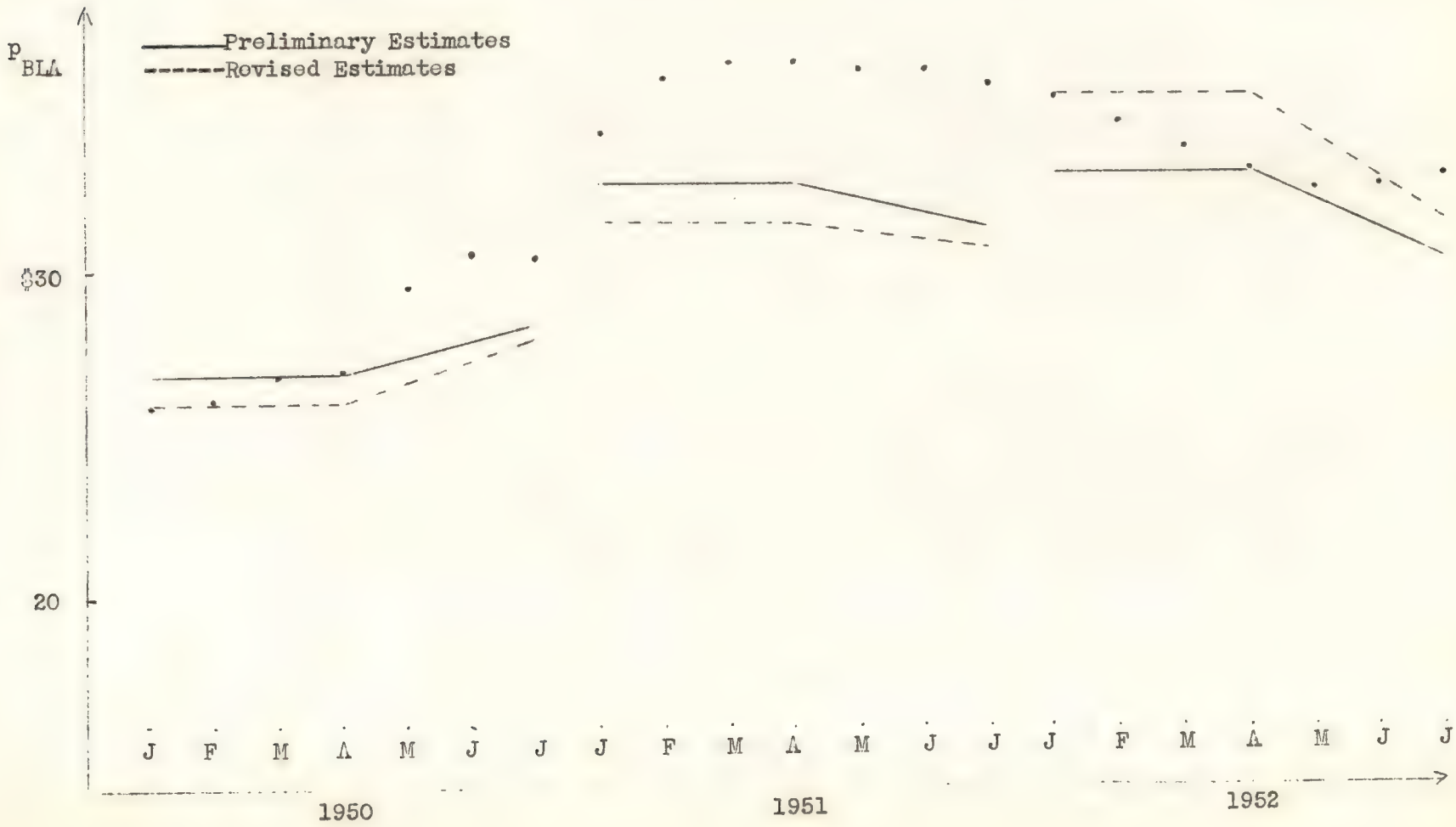


FIGURE 40 Continued

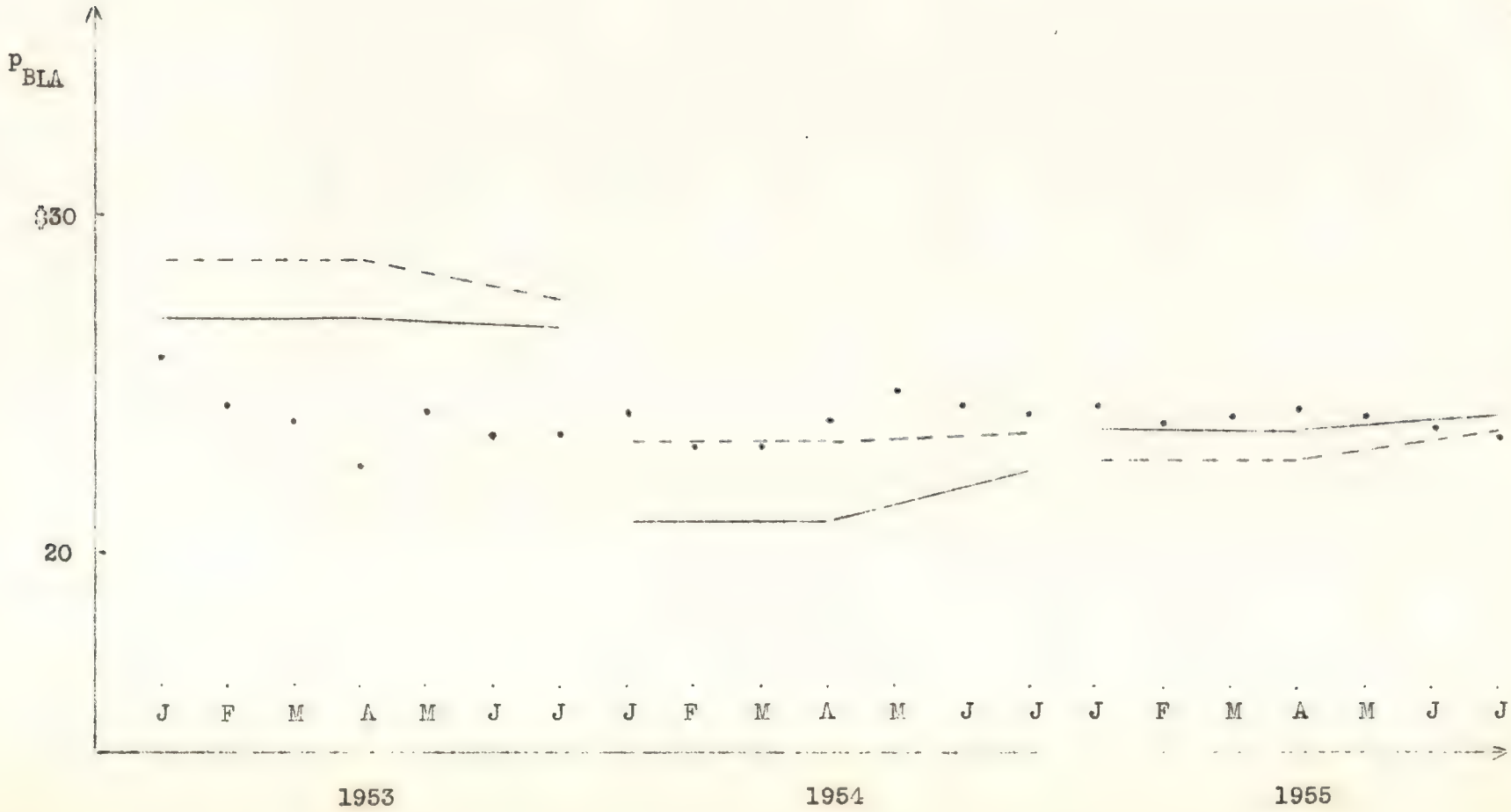


FIGURE 40 Continued

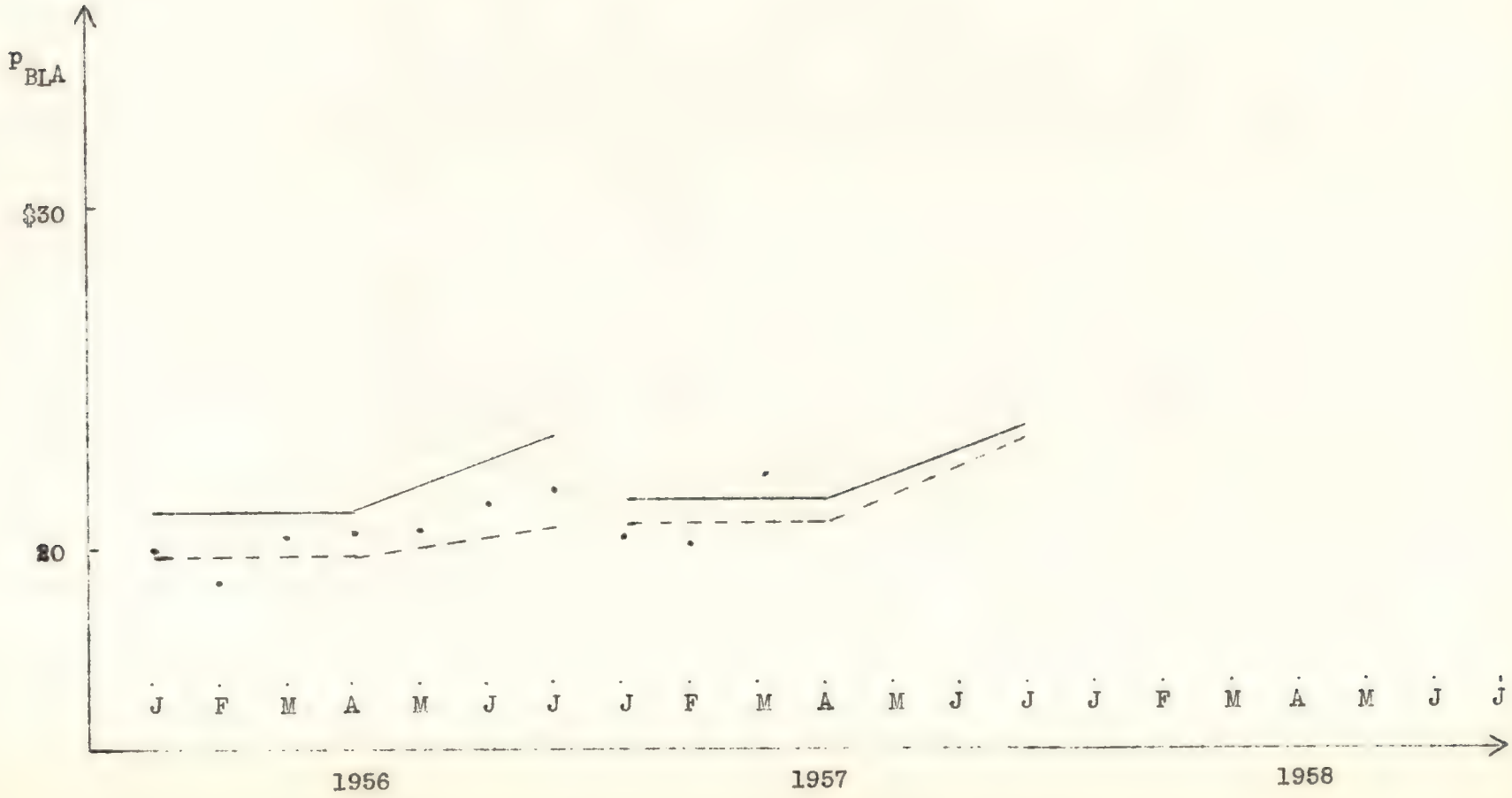


TABLE 25

Final and Revised Final Forecasts of January-July Monthly Average Prices for 900 to 1,100 Pound Choice Slaughter Steers at Los Angeles

| Year | $P'_{BLA}$ a/ | $p_1$ | $p'_2$ b/ | $p_4$ based on $p_1$ | $p_4$ based on $p_1$ and $p'_2$ c/ | $p_4$ average | $p_7$ based on $p_1$ | $p_7$ based on $P'_{BLA}$ | $p_7$ average | $p_3$ | $p_4$ d/ | $p_5$ d/ | $p_6$ d/ | $p_7$ d/ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dollars | | | | | | | | | | | | | |
| 1949 | 29.29 | 23.90 | 22.00 | 23.90 | 18.20 | 21.05 | 24.38 | 29.58 | 26.98 | 21.52 | 21.05 | 23.03 | 25.00 | 26.98 |
| | | | | | | | | | | | 23.08 | 25.06 | 27.03 | 29.01 |
| 1950 | 30.85 | 25.88 | 26.00 | 25.88 | 25.64 | 25.76 | 26.40 | 31.16 | 28.78 | 25.88 | 25.76 | 26.77 | 27.77 | 28.78 |
| | | | | | | | | | | | 26.37 | 27.38 | 28.38 | 29.39 |
| 1951 | 31.03 | 34.25 | 35.00 | 34.25 | 32.75 | 33.50 | 34.94 | 31.34 | 33.14 | 34.25 | 33.50 | 33.38 | 33.26 | 33.14 |
| | | | | | | | | | | | 35.00 | 34.88 | 34.76 | 34.64 |
| 1952 | 28.98 | 35.37 | 34.00 | 35.37 | 38.11 | 36.74 | 36.08 | 29.27 | 32.68 | 35.37 | 36.74 | 35.39 | 34.03 | 32.68 |
| | | | | | | | | | | | 34.92 | 33.57 | 32.21 | 30.86 |
| 1953 | 25.77 | 25.77 | 24.50 | 25.77 | 28.31 | 27.04 | 26.29 | 26.03 | 26.16 | 25.77 | 27.04 | 26.75 | 26.45 | 26.16 |
| | | | | | | | | | | | 24.80 | 24.51 | 24.21 | 23.92 |
| 1954 | 22.81 | 24.16 | 23.50 | 24.16 | 25.46 | 24.81 | 24.64 | 23.04 | 23.84 | 24.16 | 24.81 | 24.49 | 24.16 | 23.84 |
| | | | | | | | | | | | 24.36 | 24.03 | 23.70 | 23.39 |
| 1955 | 22.96 | 24.38 | 23.50 | 24.38 | 26.18 | 25.28 | 24.87 | 23.19 | 24.03 | 24.39 | 25.28 | 24.86 | 24.45 | 24.03 |
| | | | | | | | | | | | 24.83 | 24.41 | 24.00 | 23.58 |
| 1956 | 24.15 | 19.90 | 18.75 | 19.90 | 22.20 | 21.05 | 20.30 | 24.39 | 22.34 | 19.90 | 21.05 | 21.48 | 21.91 | 22.34 |
| | | | | | | | | | | | 20.74 | 21.17 | 21.60 | 22.03 |
| 1957 | 24.86 | 20.25 | 19.75 | 20.25 | 21.25 | 20.75 | 20.66 | 25.11 | 22.88 | 20.25 | 20.75 | 21.46 | 22.17 | 22.88 |

a/ Revised estimates made in February.
b/ Actual prices for first week of February; also taken as $p_2$.
c/ $p_4 = p_1 - 3(p_1 - p'_2)$.
d/ Lower values are revised final estimates for May through July. Although the value for April appears, it is not effective since the computation is made at the beginning of May. The value for April is the average of the predicted and actual price. May, June, and July are extended parallel to the previous estimates.

FIGURE 41

Final and Revised Final Forecasts and Actual Monthly Average Prices for 900 to 1,100 Pound Choice Slaughter Steers at Los Angeles (January-July)

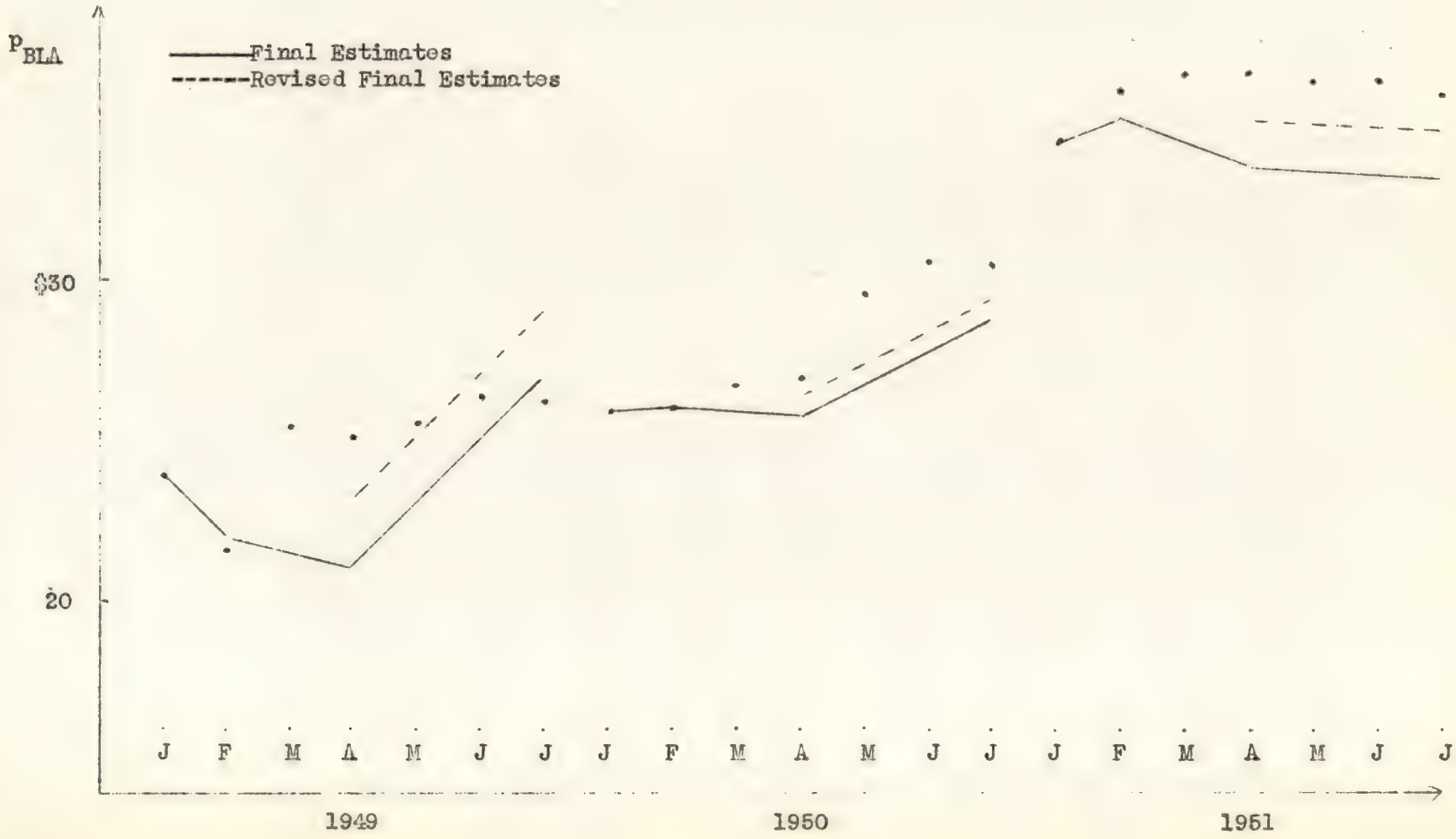


FIGURE 41 Continued

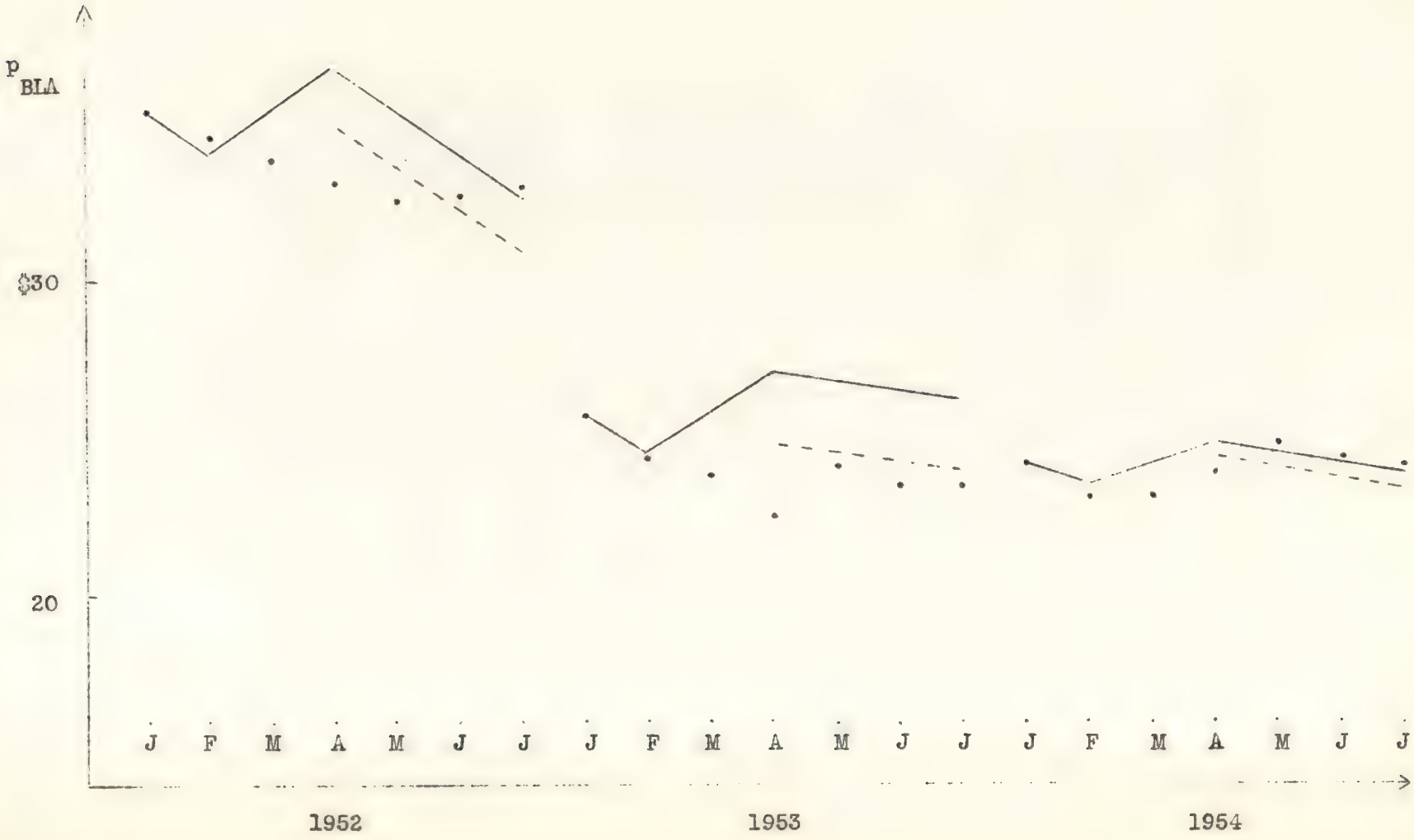


FIGURE 41 Continued

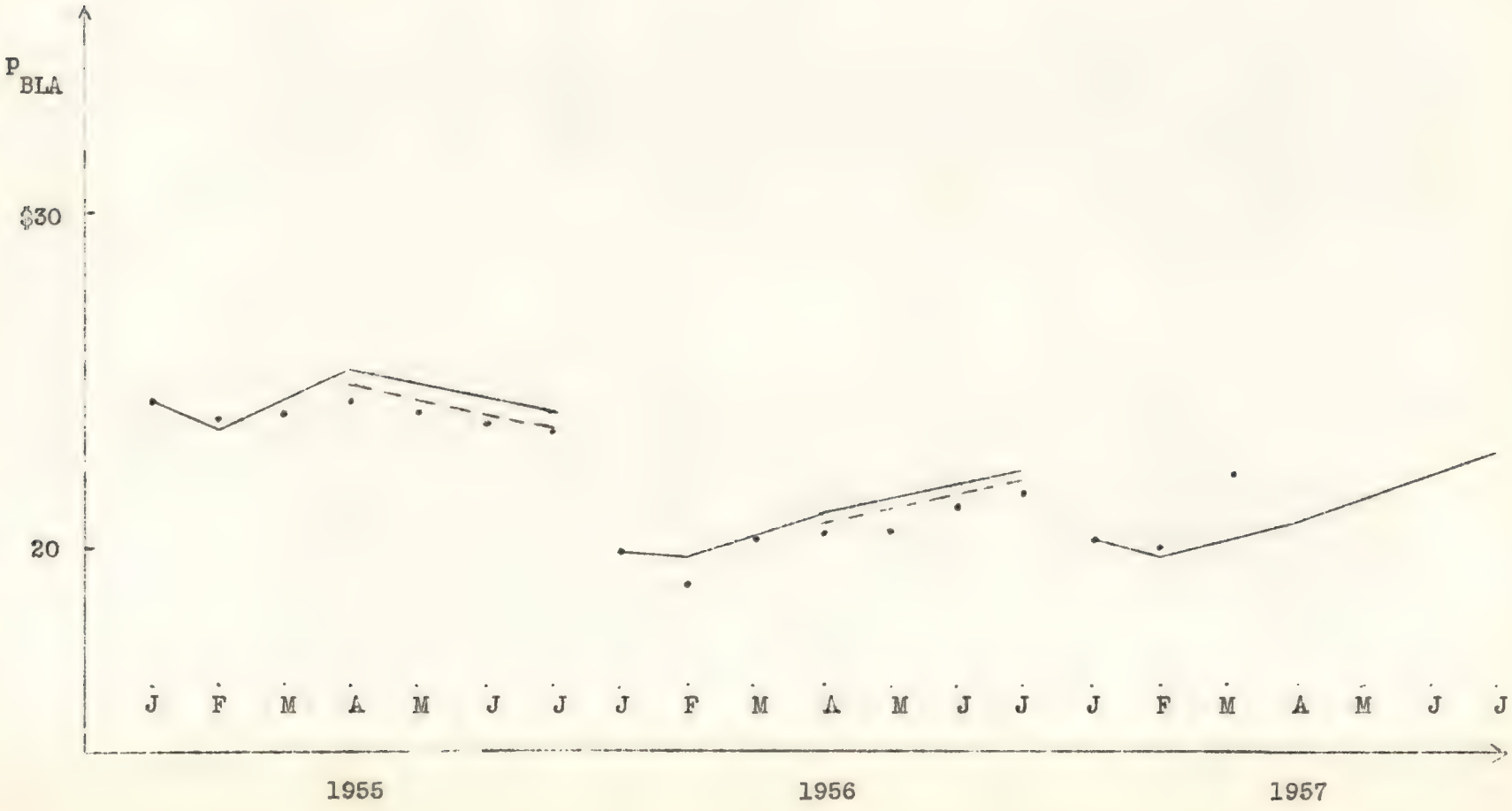


TABLE 26

Preliminary Forecasts of January-July Monthly Average Prices for 200 to 220 Pound Choice Slaughter Hogs at Los Angeles

| Year | $P'_{HLA}$ a/ | $p_{12}$ b/ | $p_1$ based on $p_{12}$ | $p_4$ based on $p_{12}$ | $p_7$ based on $p_{12}$ | $p_7$ based on $P'_{HLA}$ | $p_7$ average | $p_1$ | $p_2$ | $p_3$ | $p_4$ | $p_5$ | $p_6$ | $p_7$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dollars | | | | | | | | | | | | | |
| 1950 | 19.28 | 18.29 | 19.57 | 20.78 | 22.86 | 21.21 | 22.04 | 19.57 | 19.97 | 20.38 | 20.78 | 21.20 | 21.62 | 22.04 |
| 1951 | 20.04 | 20.81 | 22.27 | 23.64 | 26.01 | 22.04 | 24.03 | 22.27 | 22.73 | 23.18 | 23.64 | 23.77 | 23.90 | 24.03 |
| 1952 | 17.80 | 19.25 | 20.60 | 21.87 | 24.06 | 19.58 | 21.82 | 20.60 | 21.02 | 21.45 | 21.87 | 21.85 | 21.84 | 21.82 |
| 1953 | 22.75 | 20.13 | 21.54 | 24.47 | 25.16 | 25.02 | 25.09 | 21.54 | 22.52 | 23.49 | 24.47 | 24.68 | 24.88 | 25.09 |
| 1954 | 21.45 | 22.54 | 24.12 | 25.61 | 28.18 | 23.60 | 25.89 | 24.12 | 24.62 | 25.11 | 25.61 | 25.70 | 25.80 | 25.89 |
| 1955 | 20.00 | 17.63 | 18.86 | 20.03 | 22.04 | 22.00 | 22.02 | 18.86 | 19.25 | 19.64 | 20.03 | 20.69 | 21.36 | 22.02 |
| 1956 | 20.94 | 14.96 | 16.01 | 16.99 | 18.70 | 23.03 | 20.86 | 16.01 | 16.34 | 16.66 | 16.99 | 18.28 | 19.57 | 20.86 |
| 1957 | 24.04 | 15.85 | 16.96 | 18.01 | 19.81 | 26.44 | 23.12 | 16.96 | 17.31 | 17.66 | 18.01 | 19.71 | 21.42 | 23.12 |

a/ Preliminary estimates made in August of preceding year.

b/ Final estimates for $p_{12}$ for previous year.

FIGURE 42

Preliminary Forecasts and Actual Monthly Average Prices
for 200 to 220 Pound Choice Slaughter Hogs at Los Angeles (January-July)

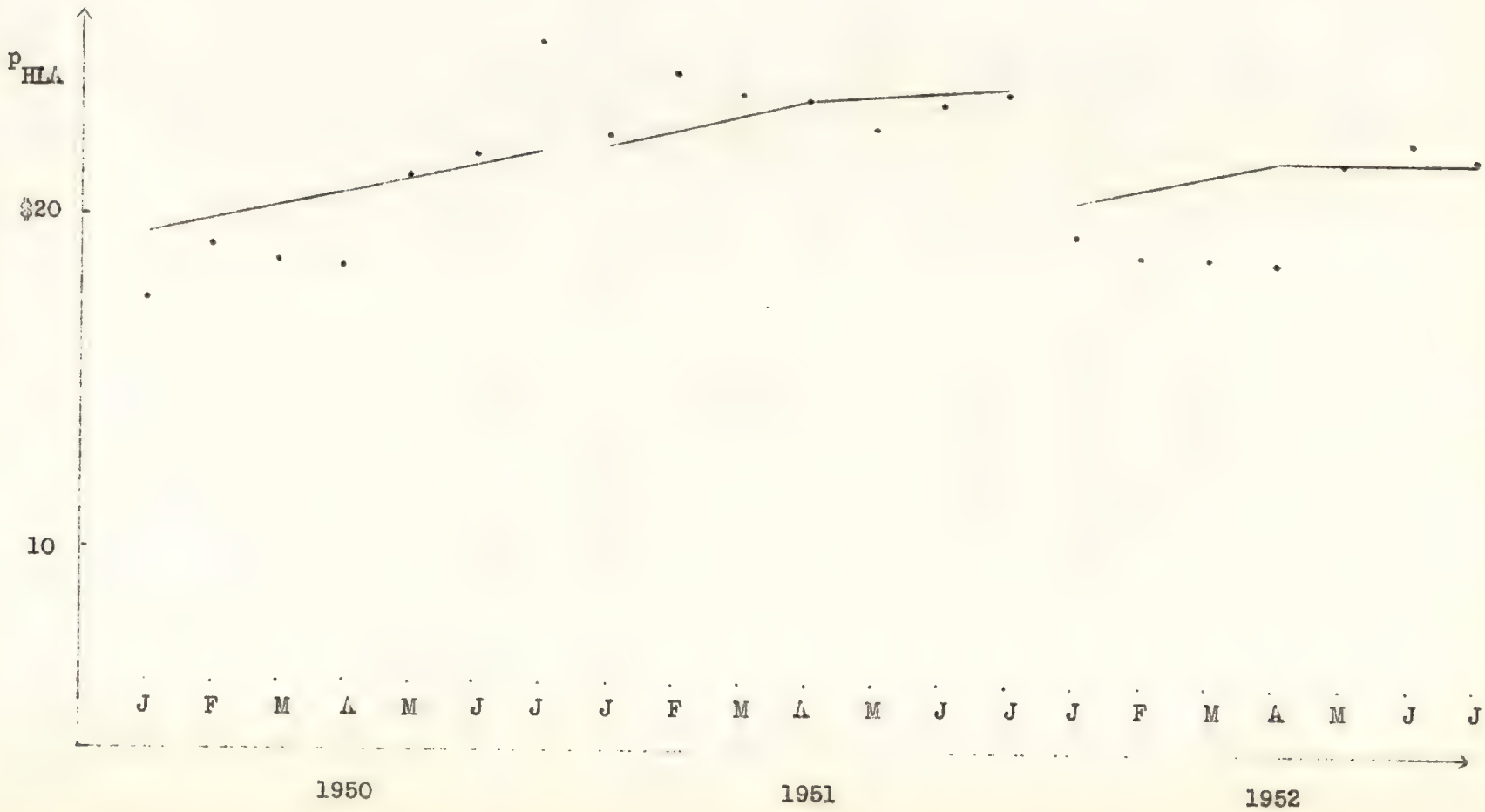


FIGURE 42 Continued

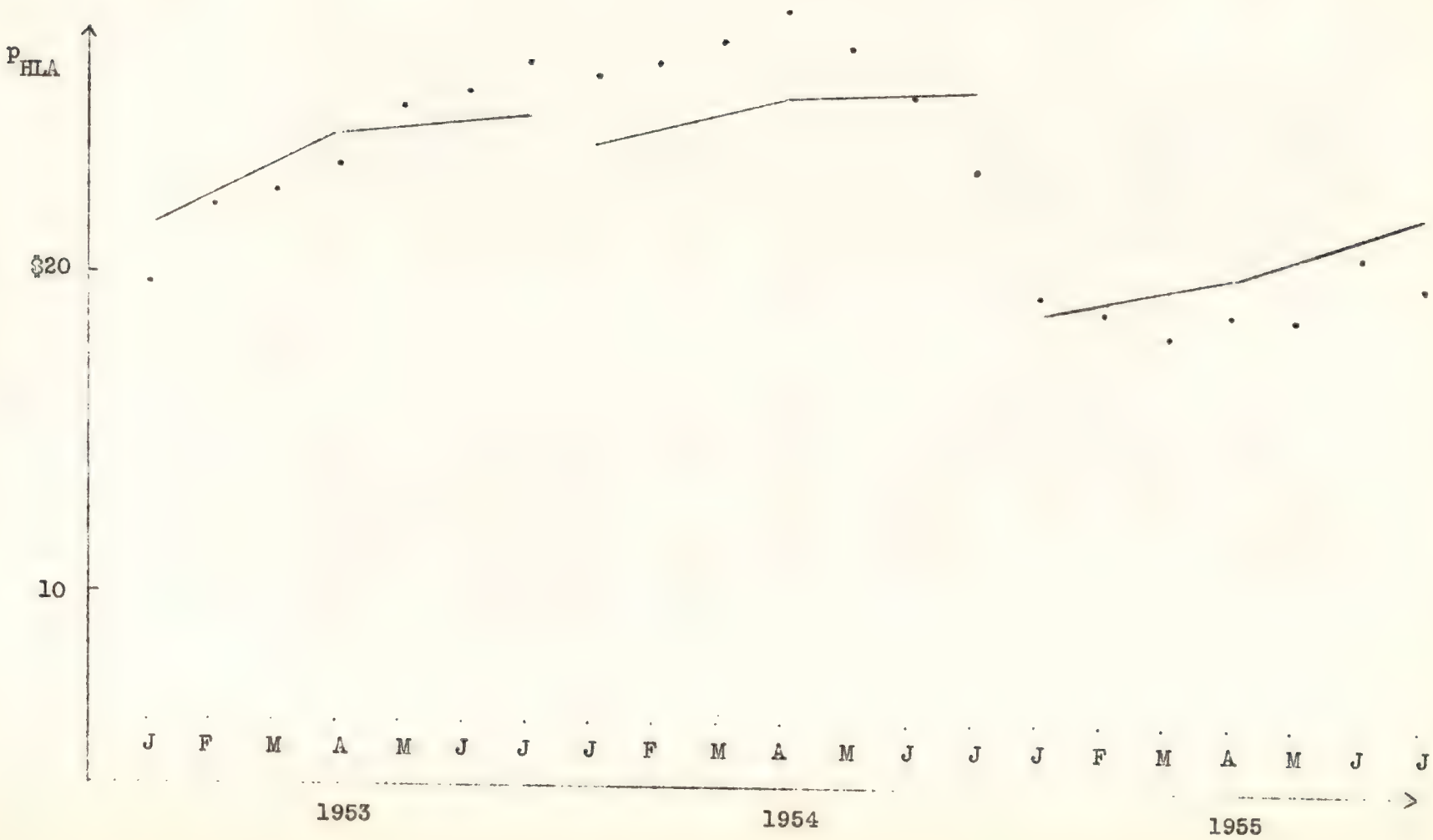


FIGURE 42 Continued

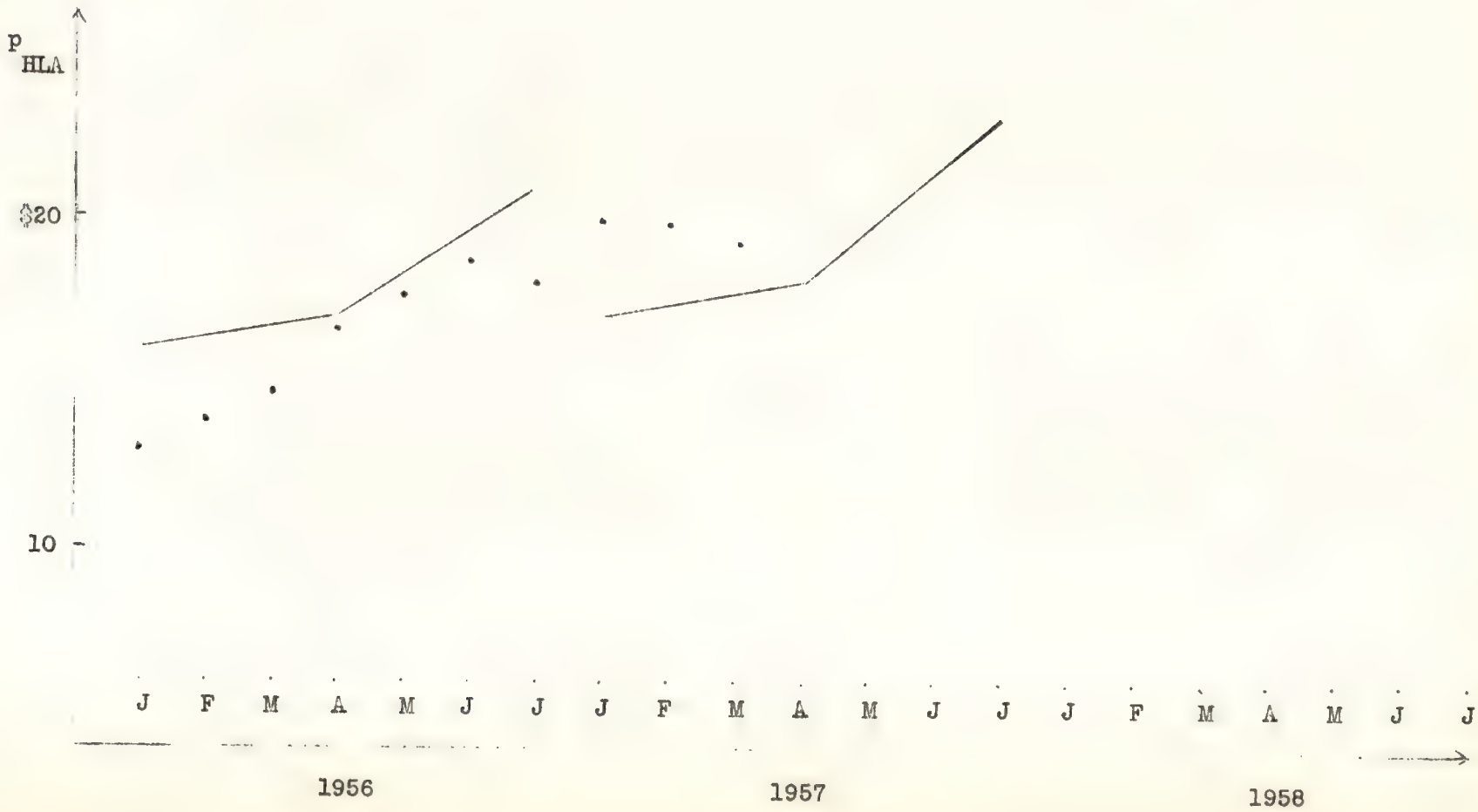


TABLE 27

Final and Revised Final Forecasts of January-July Monthly Average Prices for 200 to 220 Pound Choice Slaughter Hogs at Los Angeles

| Year | $P'_{HLA}$ a/ | $p_1$ | $p'_2$ b/ | $p_4$ based on $p_1$ | $p_4$ based on $p_1$ on $p'_2$ c/ | $p_4$ average | $p_7$ based on $p_1$ | $p_7$ based on $P'_{HLA}$ | $p_7$ average | $p_3$ | $p_4$ d/ | $p_5$ d/ | $p_6$ d/ | $p_7$ d/ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dollars | | | | | | | | | | | | | |
| 1949 | 22.95 | 23.20 | 22.25 | 24.59 | 20.35 | 22.47 | 24.82 | 25.24 | 25.03 | 22.36 | 22.47 | 23.32 | 24.18 | 25.03 |
| 1950 | 20.60 | 17.50 | 18.50 | 18.55 | 20.50 | 19.52 | 18.72 | 22.66 | 20.69 | 19.01 | n.r. e/ 19.52 | n.r. 19.91 | n.r. 20.30 | n.r. 20.69 |
| 1951 | 19.85 | 22.53 | 24.00 | 23.88 | 26.94 | 25.41 | 24.11 | 21.84 | 22.98 | 24.70 | n.r. 25.41 | n.r. 24.60 | n.r. 23.79 | n.r. 22.98 |
| 1952 | 20.24 | 19.50 | 19.00 | 20.67 | 18.00 | 19.34 | 20.86 | 22.26 | 21.56 | 19.17 | n.r. 19.34 | n.r. 20.08 | n.r. 20.82 | n.r. 21.56 |
| 1953 | 23.86 | 19.72 | 20.00 | 20.90 | 20.56 | 20.73 | 21.10 | 26.25 | 23.68 | 20.36 | n.r. 20.73 | n.r. 21.71 | n.r. 22.70 | n.r. 23.68 |
| 1954 | 22.00 | 26.36 | 27.00 | 27.94 | 28.28 | 28.11 | 28.21 | 24.20 | 26.20 | 27.56 | 22.08 28.11 | 23.06 27.47 | 24.05 26.84 | 25.03 26.20 |
| 1955 | 18.02 | 19.44 | 18.38 | 20.61 | 16.26 | 18.44 | 20.80 | 19.82 | 20.31 | 18.41 | n.r. 18.44 | n.r. 19.06 | n.r. 19.69 | n.r. 20.31 |
| 1956 | 21.33 | 12.95 | 14.75 | 13.73 | 18.35 | 16.04 | 13.86 | 23.46 | 18.66 | 15.40 | n.r. 16.04 | n.r. 19.91 | n.r. 17.79 | n.r. 18.66 |
| 1957 | 24.17 | 19.90 | 20.25 | 21.09 | 20.95 | 21.02 | 21.29 | 26.59 | 23.94 | 20.64 | n.r. 21.02 | n.r. 21.99 | n.r. 22.97 | n.r. 23.94 |

a/ Revised estimates made in February.

b/ Actual prices for first week of February; also taken as $p_2$.

c/ $p_4 = p_1 - 3(p_1 - p'_2)$.

d/ Lower values represent revised final estimates for May through July. Although the value for April appears, it is not effective since the computation is made at the beginning of May. No revisions are made unless all estimates for February, March, and April are biased in the same direction and the April bias is greater than $2.00. The revision for May, June, and July is a parallel extension of the previous estimates and is based on the actual price for April.

e/ N.r. means not revised.

TABLE 27

Final and Revised Final Forecasts of January-July Monthly Average Prices
for 200 to 220 Pound Choice Slaughter Hogs at Iowa Markets

| Year | $p_1$ [1] | $y_1$ | $y_2$ | $y_3$ Final forecast | $y_4$ Revised final forecast | $y_5$ Revised | $y_6$ Revised | $y_7$ Revised | $y_8$ | $y_9$ | $y_{10}$ | $y_{11}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1941 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 25.24 | 25.03 | 22.36 | [illegible] | [illegible] |
| 1942 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 22.56 | 27.02 | 19.01 | [illegible] | [illegible] |
| 1943 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 21.34 | 23.94 | 24.70 | 25.41 | [illegible] |
| 1944 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 22.26 | 21.56 | 19.17 | 19.38 | 20.05 |
| 1945 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 1946 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 24.30 | 26.20 | 27.56 | 26.11 | 27.02 |
| 1947 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 15.62 | 20.31 | 18.42 | 18.42 | 19.05 |
| 1948 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 23.16 | 16.66 | 23.36 | 19.40 | 19.21 |
| 1949 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 26.92 | 23.92 | 22.26 | 21.22 | n.r. |

[1] Actual prices for first week of February; also taken as $p_2$.

[2] $T_1 = p_1 - 3(p_1 - p_0)$.

[3] Lower values represent revised final estimates for May through July. Although the value for April increases, it is not effective since the expectation is made at the beginning of Mar. In reality, the revisions are made after all estimates for February, March, and April are blended in the same direction and for April more so greater than 20.00. The revision for May, June, and July is a parallel extension of the previous estimates and is based on the actual prices for April.

[4] n.r. means not revised.

FIGURE 43

Final and Revised Final Forecasts and Actual Monthly Average Prices for 200 to 220 Pound Choice Slaughter Hogs at Los Angeles (January-July)

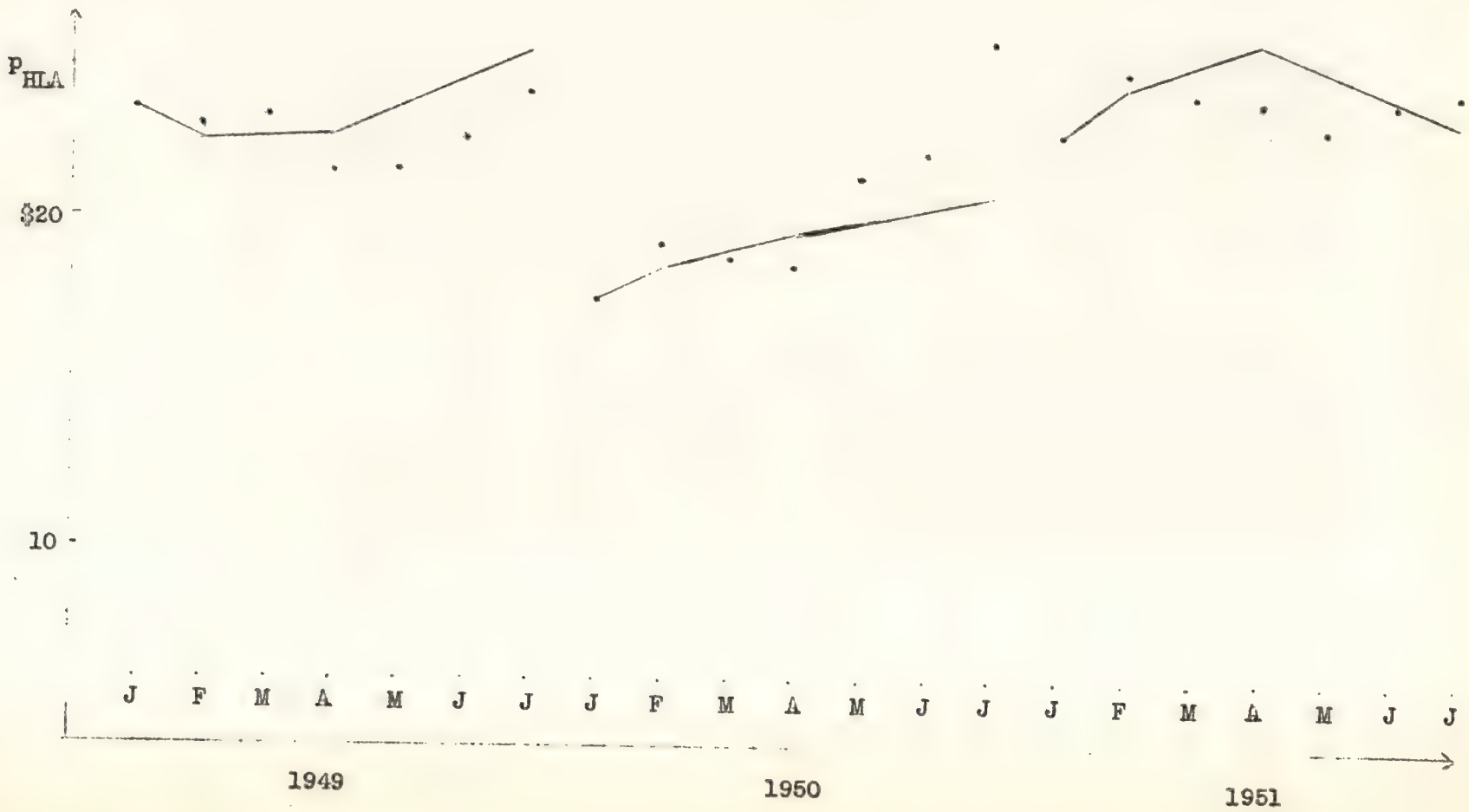


FIGURE 43 Continued

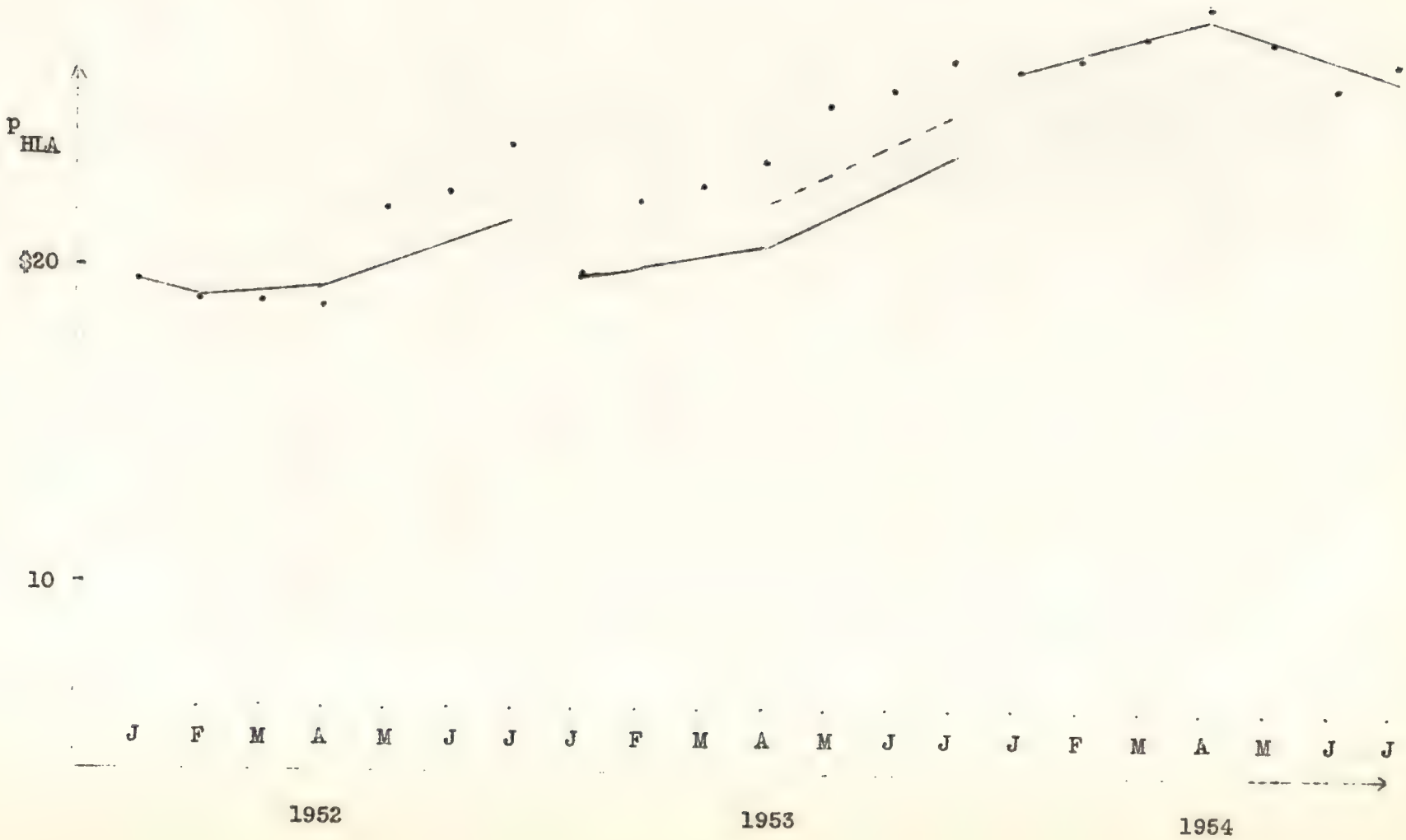


FIGURE 43 Continued

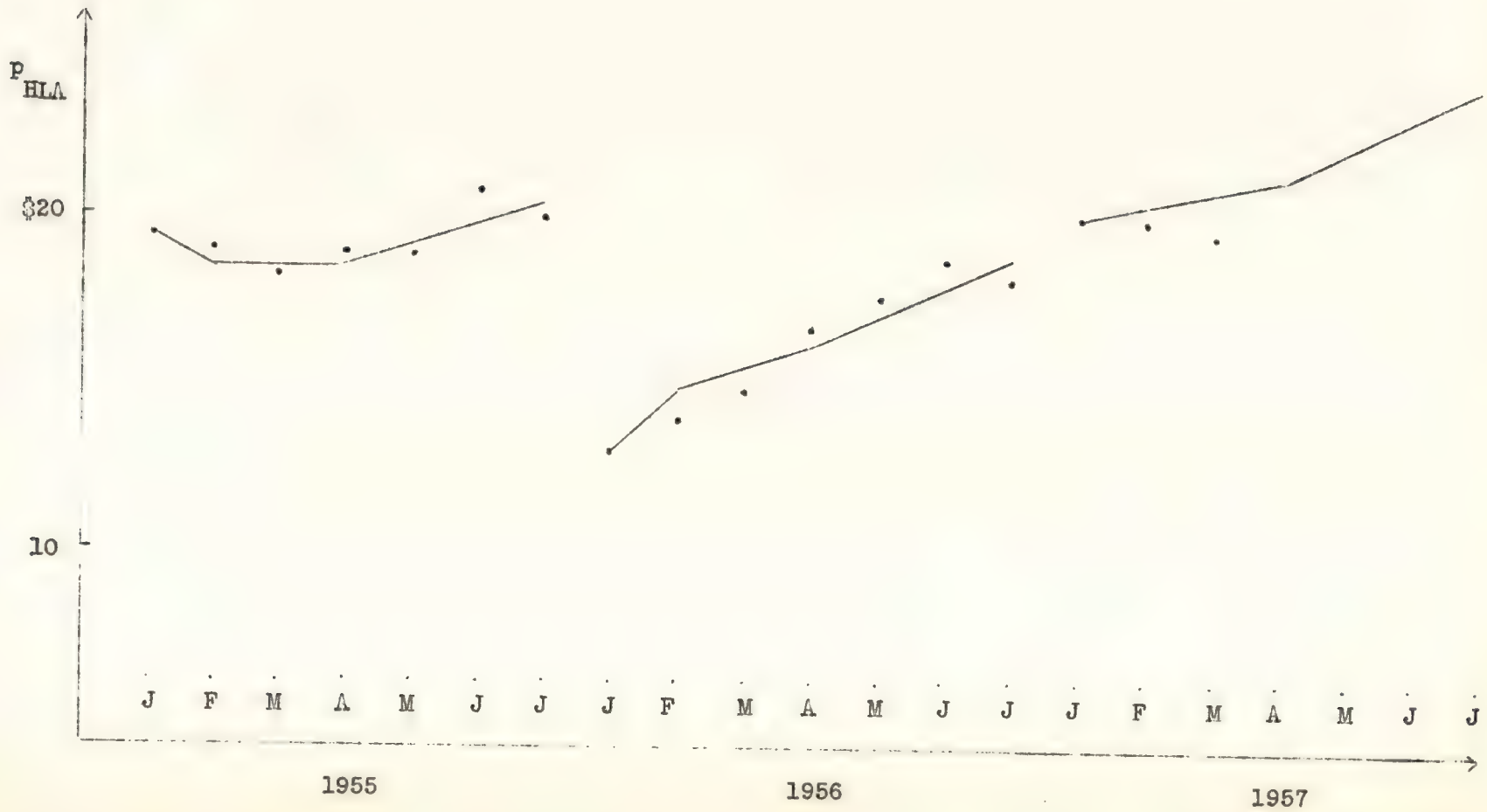


TABLE 28

Preliminary Forecasts of August-December Monthly Average Prices for 900 to 1,100 Pound Choice Slaughter Steers at Los Angeles

| Year | $P'_{BLA}$ a/ | $R = 5.0P'_{BLA}$ | $p_7$ b/ | $p_8$ based on $p_7$ | $\Delta = \frac{R - 5p_8}{10}$ | $p_8$ | $p_9$ | $p_{10}$ | $p_{11}$ | $p_{12}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| | dollars | | | | | | | | | |
| 1949 | 29.29 | 146.45 | 26.98 | 26.98 | 1.16 | 26.98 | 28.14 | 29.30 | 30.46 | 31.62 |
| 1950 | 30.85 | 154.25 | 28.78 | 28.78 | 1.04 | 28.78 | 29.82 | 30.86 | 31.90 | 32.94 |
| 1951 | 31.03 | 155.15 | 33.14 | 33.14 | -1.06 | 33.14 | 32.08 | 31.02 | 29.96 | 28.90 |
| 1952 | 28.98 | 144.90 | 32.68 | 32.68 | -1.85 | 32.68 | 30.83 | 28.98 | 27.13 | 25.28 |
| 1953 | 25.77 | 128.85 | 26.16 | 26.16 | - .20 | 26.16 | 25.96 | 25.76 | 25.56 | 25.36 |
| 1954 | 22.81 | 114.05 | 23.84 | 23.84 | - .52 | 23.84 | 23.32 | 22.80 | 22.28 | 21.76 |
| 1955 | 22.96 | 114.80 | 24.03 | 24.03 | - .54 | 24.03 | 23.49 | 22.95 | 22.41 | 21.87 |
| 1956 | 24.15 | 120.75 | 22.34 | 22.34 | .91 | 22.34 | 23.25 | 24.16 | 25.07 | 25.98 |
| 1957 | 24.86 | 124.30 | 22.88 | 22.88 | .99 | 22.88 | 23.87 | 24.86 | 25.85 | 26.84 |

a/ Revised estimates of $P_{BLA}$ made in February.

b/ Final estimates of $p_7$ made in February.

TABLE 29

Revised Forecasts of August-December Monthly Average Prices for 900 to 1,100 Pound Choice Slaughter Steers at Los Angeles

| Year | $p_4$ | $p_5$ | $p'_6$ a/ | $p_7$ based on $p_4$ and $p'_6$ b/ | $S'_7 = \sum_{i=1}^{7} p_i$ c/ | $\bar{p}_{567}$ d/ | $P'_{BLA}$ based on $\bar{p}_{567}$ e/ | $R = 12P'_{BLA} - S'_7$ | $\Delta = \frac{R - 5p_8}{10}$ | $p_8$ f/ | $p_9$ | $p_{10}$ | $p_{11}$ | $p_{12}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dollars | | | | | | | | | | | | | |
| 1949 | 25.12 | 25.57 | 26.50 | 27.19 | 175.22 | 26.42 | 25.94 | 136.06 | .51 | 26.20 | 26.71 | 27.22 | 27.73 | 28.24 |
| 1950 | 26.98 | 29.49 | 30.00 | 31.51 | 196.51 | 30.33 | 29.75 | 160.49 | 1.02 | 30.05 | 31.07 | 32.09 | 33.11 | 34.13 |
| 1951 | 36.50 | 36.21 | 35.00 | 34.25 | 248.61 | 35.15 | 34.44 | 164.67 | - .92 | 34.78 | 33.86 | 32.94 | 32.02 | 31.10 |
| 1952 | 33.11 | 32.56 | 32.00 | 31.44 | 232.88 | 32.00 | 31.37 | 143.56 | -1.48 | 31.68 | 30.20 | 28.72 | 27.24 | 25.76 |
| 1953 | 22.57 | 24.08 | 24.00 | 24.72 | 169.28 | 24.27 | 23.85 | 116.92 | - .35 | 24.09 | 23.74 | 23.39 | 23.04 | 22.69 |
| 1954 | 23.92 | 24.83 | 24.00 | 24.04 | 167.20 | 24.29 | 23.86 | 119.12 | - .14 | 24.10 | 23.96 | 23.82 | 23.68 | 23.54 |
| 1955 | 24.38 | 24.08 | 23.25 | 22.68 | 166.67 | 23.34 | 22.94 | 108.61 | - .72 | 23.17 | 22.45 | 21.73 | 21.01 | 20.29 |
| 1956 | 20.44 | 20.50 | 20.25 | 20.16 | 140.50 | 20.30 | 19.98 | 99.26 | - .16 | 20.18 | 20.02 | 19.86 | 19.70 | 19.54 |

a/ Actual prices for first week of June; taken as estimates for $p_6$.

b/ Linear extrapolation based on $p_4$ and $p'_6$.

c/ $p_1 + p_2 + p_3 + p_4 + p_5 + p'_6 + p_7$ (based on $p_4$ and $p'_6$).

d/ $1/3\ (p_5 + p_6 + p_7$ (based on $p_4$ and $p'_6$)).

e/ Based on using $\bar{p}_{567}$ in equation 13.

f/ $p_8$ is based on $P'_{BLA}$ based on $\bar{p}_{567}$.

FIGURE 44

Preliminary and Revised Forecasts and Actual Monthly Average Prices for 900 to 1,100 Pound Choice Slaughter Steers at Los Angeles (August-December)

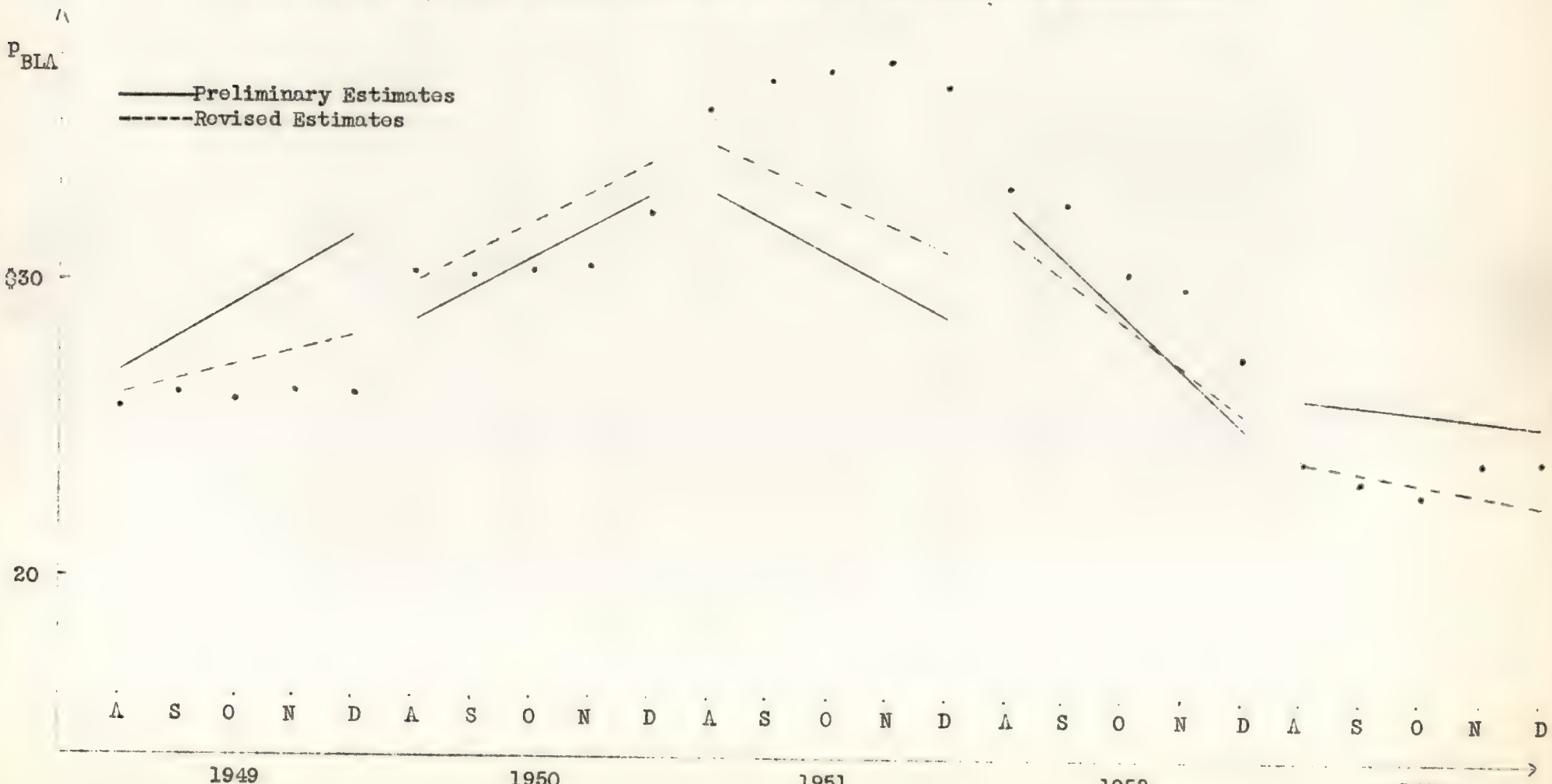


FIGURE 44 Continued

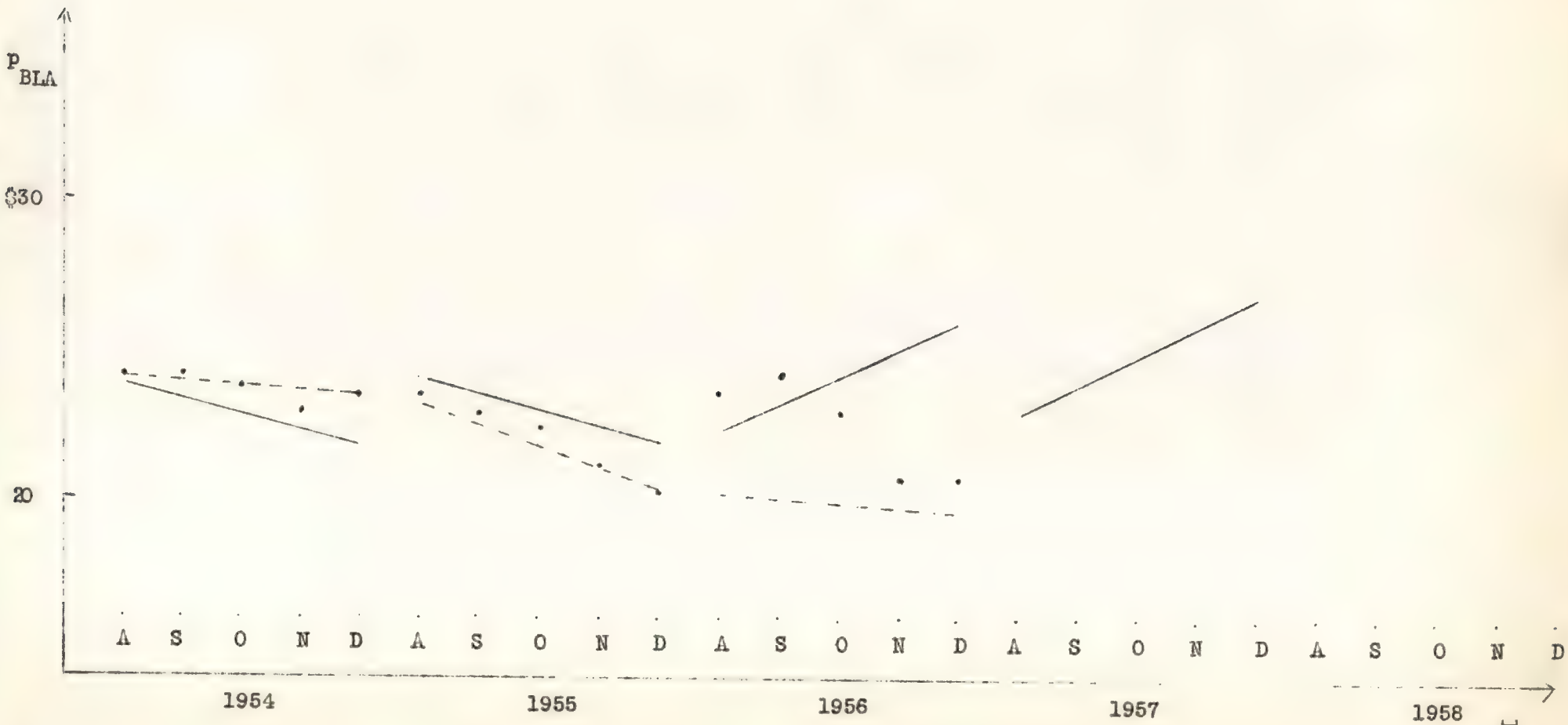


TABLE 30

Final Forecasts of August-December Monthly Average Prices
for 900 to 1,100 Pound Choice Slaughter Steers at Los Angeles

| Year | $P'_{BLA}$ a/ | $12P'_{BLA}$ | $S_7 = \sum_{i=1}^{7} p_i$ | $R = 12P'_{BLA} - S_7$ | $5\bar{p}$ | $\Delta = \frac{R - 5\bar{p}}{10}$ | $\bar{p} = \frac{p'_8 + 1.01P'_{BLA}}{2}$ | $p_8$ b/ | $p_9$ | $p_{10}$ | $p_{11}$ | $p_{12}$ | $p'_8$ | $1.01P'_{BLA}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dollars | | | | | | | | | | | | | |
| 1949 | 25.54 | 306.48 | 174.00 | 132.48 | 129.50 | .30 | 25.90 | 25.90 | 26.20 | 26.50 | 26.80 | 27.10 | 26.00 | 25.80 |
| 1950 | 29.56 | 354.72 | 195.93 | 158.79 | 152.15 | .66 | 30.43 | 30.43 | 31.09 | 31.75 | 32.41 | 33.07 | 31.00 | 29.86 |
| 1951 | 35.36 | 424.32 | 251.42 | 172.90 | 178.65 | - .58 | 35.73 | 35.73 | 35.15 | 34.57 | 33.99 | 33.41 | 35.75 | 35.71 |
| 1952 | 32.08 | 384.96 | 235.09 | 149.87 | 163.50 | -1.36 | 32.70 | 32.70 | 31.34 | 29.98 | 28.62 | 27.26 | 33.00 | 32.40 |
| 1953 | 23.26 | 279.12 | 267.50 | 111.62 | 117.50 | - .59 | 23.50 | 23.50 | 22.91 | 22.32 | 21.73 | 21.14 | 23.50 | 23.49 |
| 1954 | 24.03 | 288.36 | 167.72 | 120.64 | 121.80 | - .12 | 24.36 | 24.36 | 24.24 | 24.12 | 24.00 | 23.88 | 24.45 | 24.27 |
| 1955 | 23.36 | 280.32 | 167.97 | 112.35 | 117.75 | - .54 | 23.55 | 23.55 | 23.01 | 22.47 | 21.93 | 21.39 | 23.50 | 23.59 |
| 1956 | 20.84 | 250.08 | 143.12 | 106.96 | 110.15 | - .32 | 22.03 | 23.00 | 22.68 | 22.36 | 22.04 | 21.72 | 23.00 | 21.05 |

a/ Final estimates (2).

b/ $p_8$ is taken as $\bar{p}$ if $|p'_8 - 1.01P'_{BLA}| < \$1.75$; otherwise, $p_8 = p'_8$. $p'_8$ is actual average price for first week of August.

FIGURE 45

Final Forecasts and Actual Monthly Average Prices
for 900 to 1,100 Pound Choice Slaughter Steers at Los Angeles (August-December)

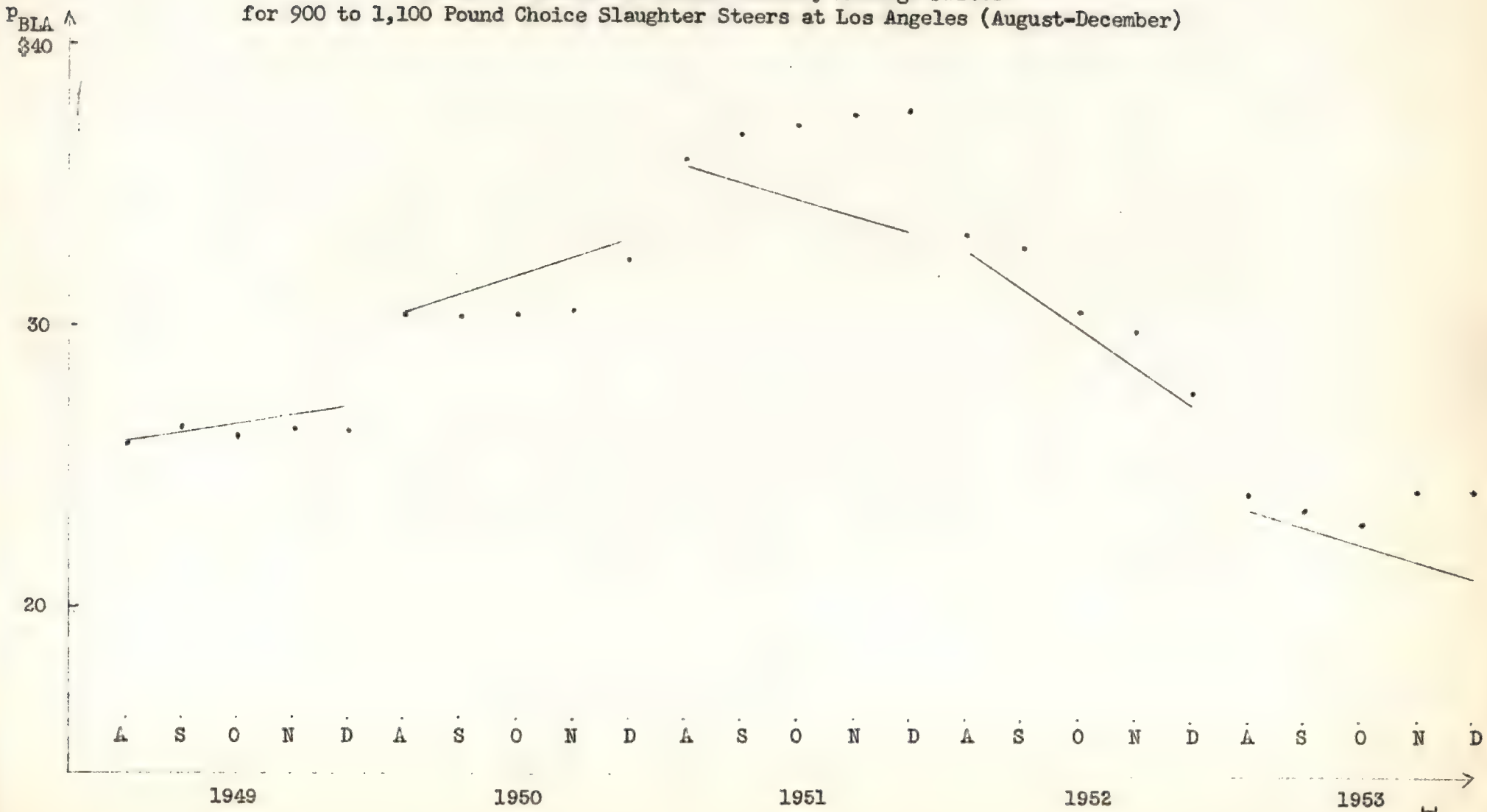


FIGURE 45 Continued

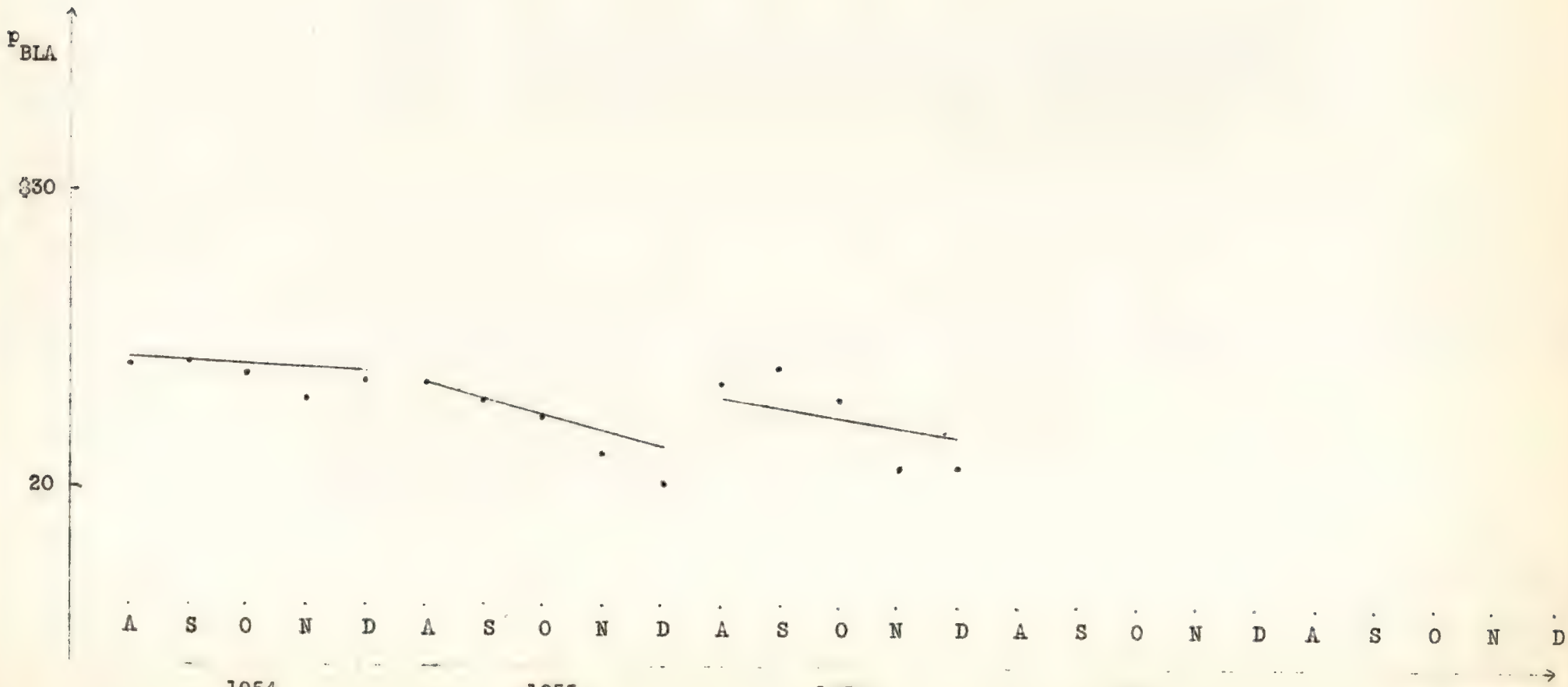


TABLE 31

Preliminary Forecasts of August-December Monthly Average Prices for 200 to 220 Pound Choice Slaughter Hogs at Los Angeles

| Year | $p_6$ a/ | $P'_{HLA}$ based on $p_6$ b/ | $12P'_{HLA}$ | $S'_7 = \sum_{i=1}^{7} p_i$ c/ | $R = 12P'_{HLA} - S'_7$ | $p_8$ based on $p_6$ | $\Delta = \frac{R - 5p_8}{9}$ | $p_8$ | $p_9$ | $p_{10}$ | $p_{11}$ | $p_{12}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dollars | | | | | | | | | | | |
| 1949 | 24.18 | 22.55 | 270.60 | 162.81 | 107.79 | 24.66 | -1.72 | 24.66 | 22.94 | 21.22 | 19.50 | 19.50 |
| 1950 | 20.30 | 18.58 | 222.96 | 135.43 | 87.53 | 20.71 | -1.78 | 20.71 | 18.93 | 17.15 | 15.37 | 15.37 |
| 1951 | 23.79 | 22.15 | 265.80 | 168.01 | 97.79 | 24.27 | -2.50 d/ | 24.27 | 21.77 | 19.27 | 16.77 | 16.77 |
| 1952 | 20.82 | 19.11 | 229.32 | 139.47 | 89.85 | 21.24 | -1.82 | 21.24 | 19.42 | 17.60 | 15.78 | 15.78 |
| 1953 | 22.70 | 21.04 | 252.48 | 148.90 | 103.58 | 23.15 | -1.35 | 23.15 | 21.80 | 20.45 | 19.10 | 19.10 |
| 1954 | 26.84 | 25.28 | 303.36 | 189.54 | 113.82 | 27.38 | -2.50 d/ | 27.38 | 24.88 | 22.38 | 19.88 | 19.88 |
| 1955 | 19.69 | 17.95 | 215.40 | 133.73 | 81.67 | 20.08 | -2.08 | 20.08 | 18.00 | 15.92 | 13.84 | 13.84 |
| 1956 | 17.79 | 16.00 | 192.00 | 115.50 | 76.50 | 18.15 | -1.58 | 18.15 | 16.57 | 14.99 | 13.41 | 13.41 |
| 1957 | 22.97 | 21.31 | 255.72 | 150.71 | 105.01 | 23.43 | -1.35 | 23.43 | 22.08 | 20.73 | 19.38 | 19.38 |

a/ Final estimates made in February of given year.

b/ $p_6$ is used in equation 14 as an estimate of $\overline{p}_{567}$ since $p_5$, $p_6$, and $p_7$, as estimated, lie on a straight line.

c/ $S'_7$ is the sum of the January-July final estimates.

d/ Whenever $\Delta$, as computed, is less than -2.50, then $\Delta$ = -2.50 is used.

TABLE 32

Revised Forecasts of August-December Monthly Average Prices for 200 to 220 Pound Choice Slaughter Hogs at Los Angeles

| Year | $p_6'$ a/ | $P'_{HLA}$ based on $p_6'$ b/ | $p_7$ based on $p_6'$ | $p_8$ based on $p_6'$ | $12P'_{HLA}$ | $S'_7 = \sum_{i=1}^{7} p_i$ c/ | $R = 12P'_{HLA} - S'_7$ | $\Delta = \frac{R - 5p_8}{9}$ d/ | $p_8$ | $p_9$ | $p_{10}$ | $p_{11}$ | $p_{12}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dollars | | | | | | | | | | | | |
| 1949 | 22.50 | 20.83 | 23.18 | 22.95 | 249.96 | 157.28 | 92.68 | -2.45 | 22.95 | 20.50 | 18.05 | 15.60 | 15.60 |
| 1950 | 21.50 | 19.81 | 22.14 | 21.93 | 237.72 | 138.77 | 98.95 | -1.19 | 21.93 | 20.74 | 19.55 | 18.36 | 18.36 |
| 1951 | 23.88 | 22.24 | 24.60 | 24.36 | 266.88 | 165.50 | 101.38 | -2.27 | 24.36 | 22.09 | 19.82 | 17.55 | 17.55 |
| 1952 | 22.62 | 20.95 | 23.30 | 23.07 | 251.40 | 143.89 | 107.51 | - .87 | 23.07 | 22.20 | 21.33 | 20.46 | 20.46 |
| 1953 | 26.25 | 24.67 | 27.04 | 26.78 | 296.04 | 166.60 | 129.44 | - .50 | 26.78 | 26.28 | 25.78 | 25.28 | 25.28 |
| 1954 | 27.25 | 25.70 | 28.07 | 27.80 | 308.40 | 191.48 | 116.92 | -2.45 | 27.80 | 25.35 | 22.90 | 20.45 | 20.45 |
| 1955 | 19.50 | 17.76 | 20.08 | 19.89 | 213.12 | 133.80 | 79.32 | -2.24 | 19.89 | 17.65 | 15.41 | 13.17 | 13.17 |
| 1956 | 18.75 | 16.99 | 19.31 | 19.12 | 203.88 | 113.58 | 90.30 | - .59 | 19.12 | 18.53 | 17.94 | 17.35 | 17.35 |

a/ Actual prices for first week of June.

b/ $p_6'$ is used in equation 14 as an estimate of $\overline{p}_{567}$.

c/ $S'_7 = (p_1 + p_2 + p_3 + p_4 + p_5 + p_6' + p_7 \text{ (based on } p_6'))$.

d/ If $\Delta$ is less than -2.50 when computed, then $\Delta = -2.50$ is used.

FIGURE 46

Preliminary and Revised Forecasts and Actual Monthly Average Prices for 200 to 220 Pound Choice Slaughter Hogs at Los Angeles (August-December)

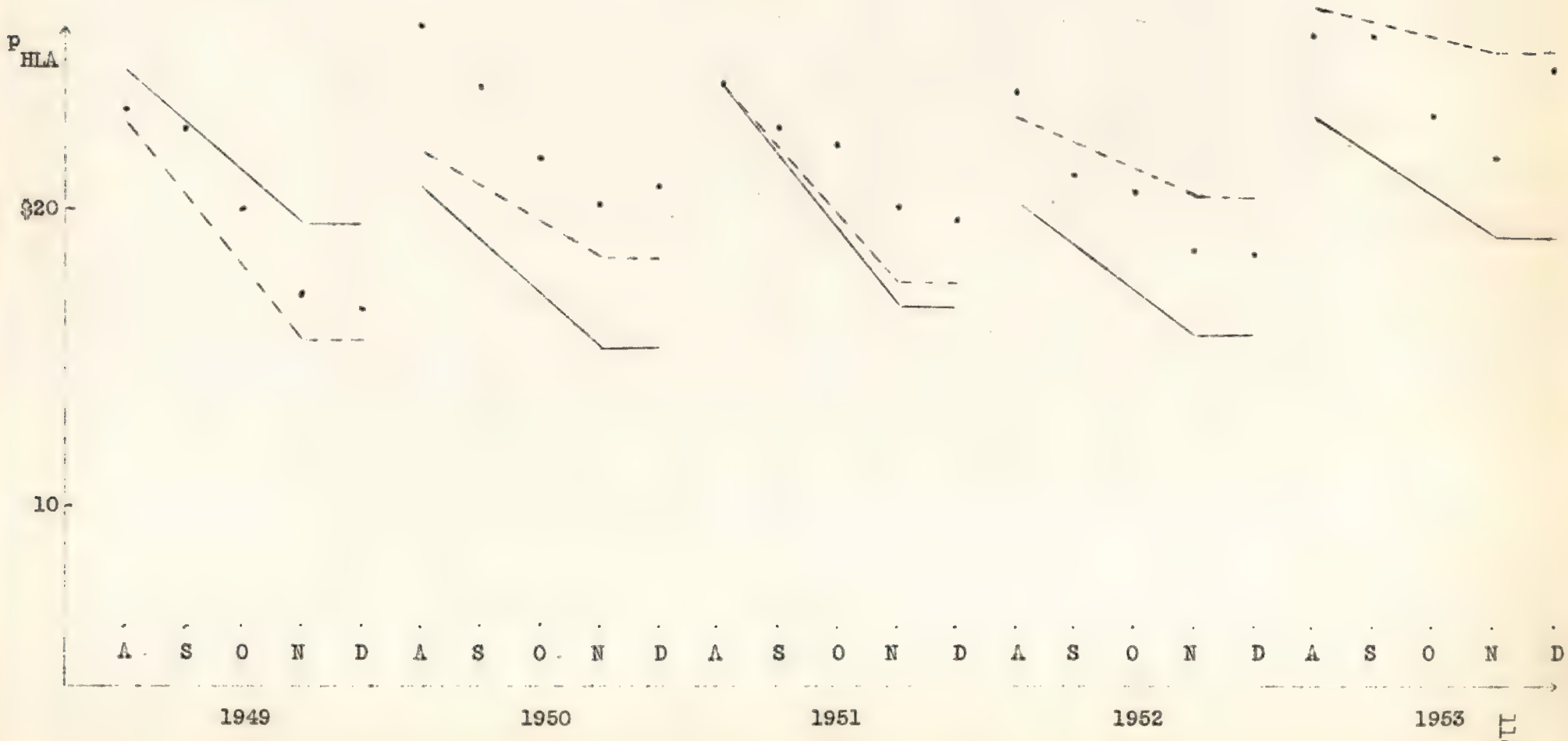


FIGURE 46 Continued

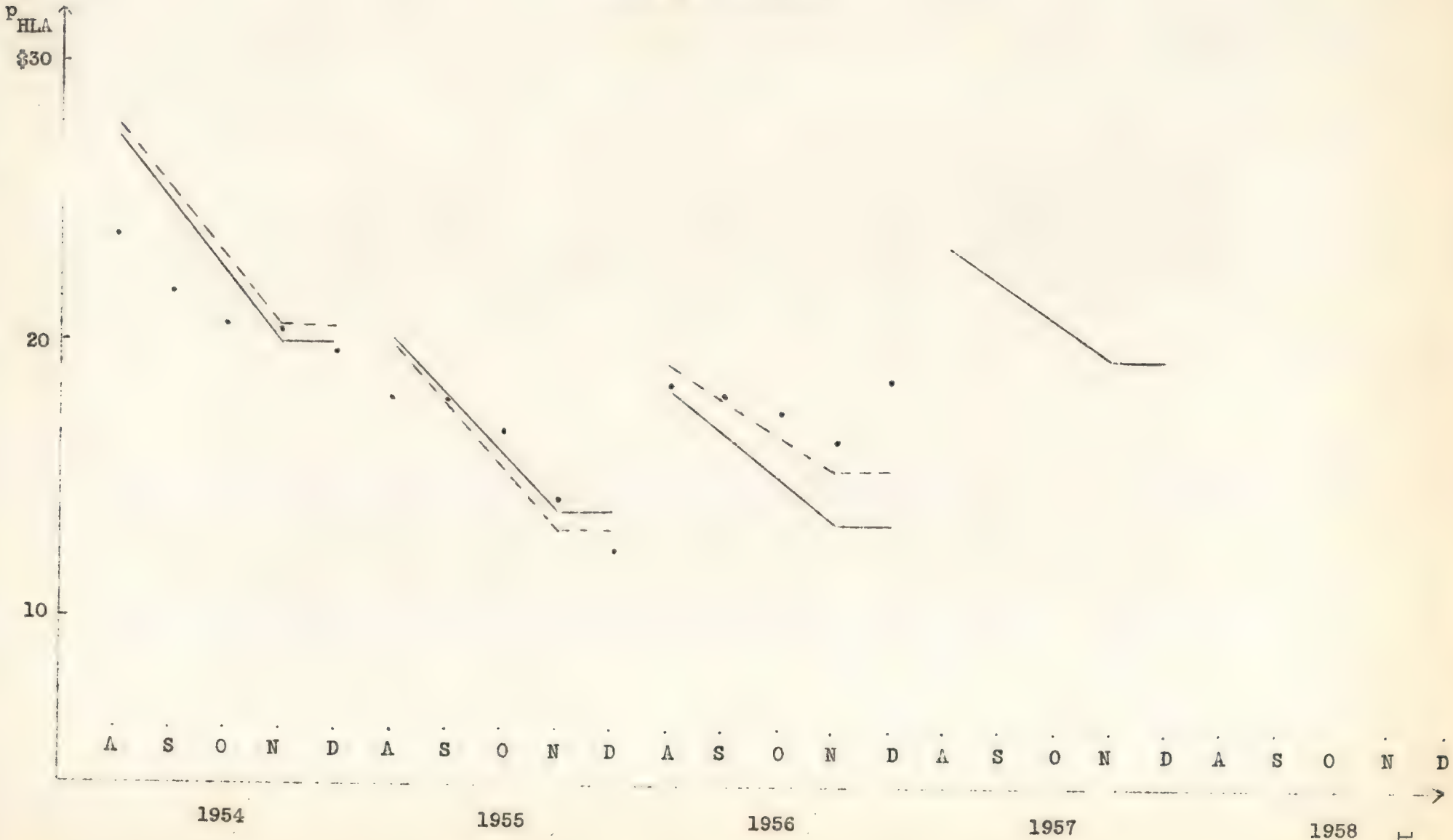


TABLE 33

Final Forecasts of August-December Monthly Average Prices for 200 to 220 Pound Choice Slaughter Hogs at Los Angeles

| Year | $P'_{HLA}$ a/ | $12P'_{HLA}$ | $S_7 = \sum_{i=1}^{7} p_i$ | $R = 12P'_{HLA} - S_7$ | $\bar{R} = 4.89P'_{HLA}$ | $\bar{p} = \frac{p'_8 + 1.09P'_{HLA}}{2}$ | $\triangle = \frac{R' - 5p'}{9}$ b/ | $p_8$ c/ | $p_9$ | $p_{10}$ | $p_{11}$ | $p_{12}$ | $p'_8$ | $1.09P'_{HLA}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | dollars | | | | | | | | | | | | | |
| 1949 | 20.83 | 249.96 | 157.72 | 92.24 | 101.86 | 23.48 | -1.73 | 23.48 | 21.75 | 20.02 | 18.29 | 18.29 | 24.25 | 22.70 |
| 1950 | 21.16 | 253.92 | 142.40 | 111.52 | 103.47 | 24.53 | -1.24 | 24.53 | 23.29 | 22.05 | 20.81 | 20.81 | 26.00 | 23.06 |
| 1951 | 21.70 | 260.40 | 164.32 | 96.08 | 106.11 | 24.20 | -1.65 | 24.20 | 22.55 | 20.90 | 19.25 | 19.25 | 24.75 | 23.65 |
| 1952 | 21.08 | 252.96 | 144.31 | 108.65 | 103.08 | 24.12 | -1.33 | 24.12 | 22.79 | 21.46 | 20.13 | 20.13 | 25.25 | 22.98 |
| 1953 | 24.38 | 292.56 | 165.85 | 126.71 | 119.22 | 25.78 | -1.08 | 25.78 | 24.70 | 23.62 | 22.54 | 22.54 | 25.00 | 26.57 |
| 1954 | 23.92 | 287.04 | 185.36 | 101.68 | 116.97 | 24.38 | -2.25 | 24.38 | 22.13 | 19.88 | 17.63 | 17.63 | 22.68 | 26.07 |
| 1955 | 18.02 | 216.24 | 134.73 | 81.51 | 88.12 | 18.32 | -1.12 | 18.32 | 17.20 | 16.08 | 14.96 | 14.96 | 17.00 | 19.64 |
| 1956 | 16.30 | 195.60 | 112.18 | 83.42 | 79.71 | 17.95 | - .70 | 17.95 | 17.25 | 16.55 | 15.85 | 15.85 | 18.13 | 17.77 |

a/ Final estimates (2).

b/ $R'$ is larger or smaller of $R$ or $\bar{R}$ depending on whether $p'_8$ is greater or smaller than $1.09P'_{HLA}$. Furthermore, $p' = \bar{p}$ unless $|\triangle| > 2.50$. Otherwise, $p' = p'_8$. $p'_8$ is actual average price for first week of August

c/ $p_8 = p'$.

FIGURE 47

Final Forecasts and Actual Monthly Average Prices
for 200 to 220 Pound Choice Slaughter Hogs at Los Angeles (August-December)

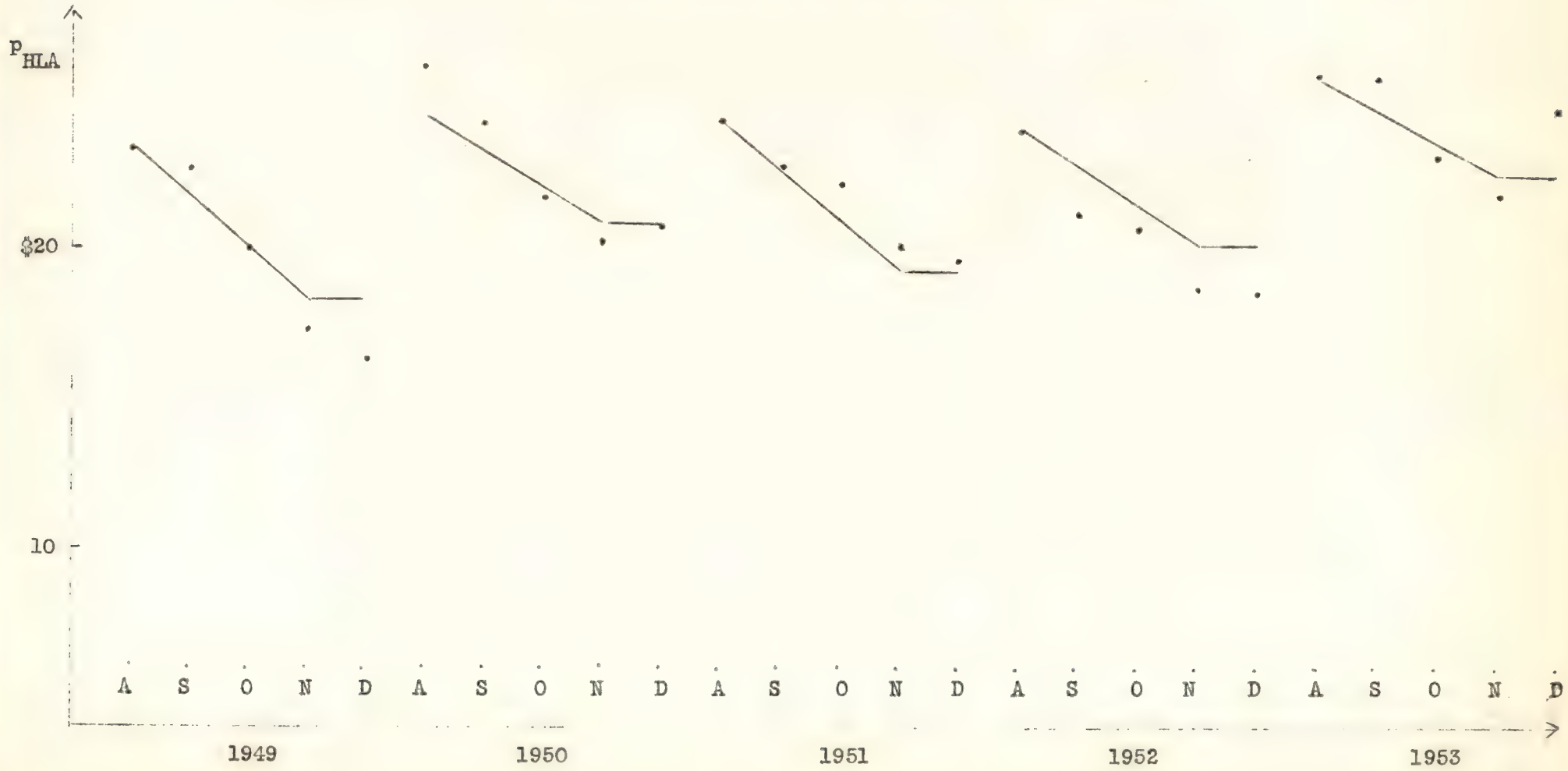
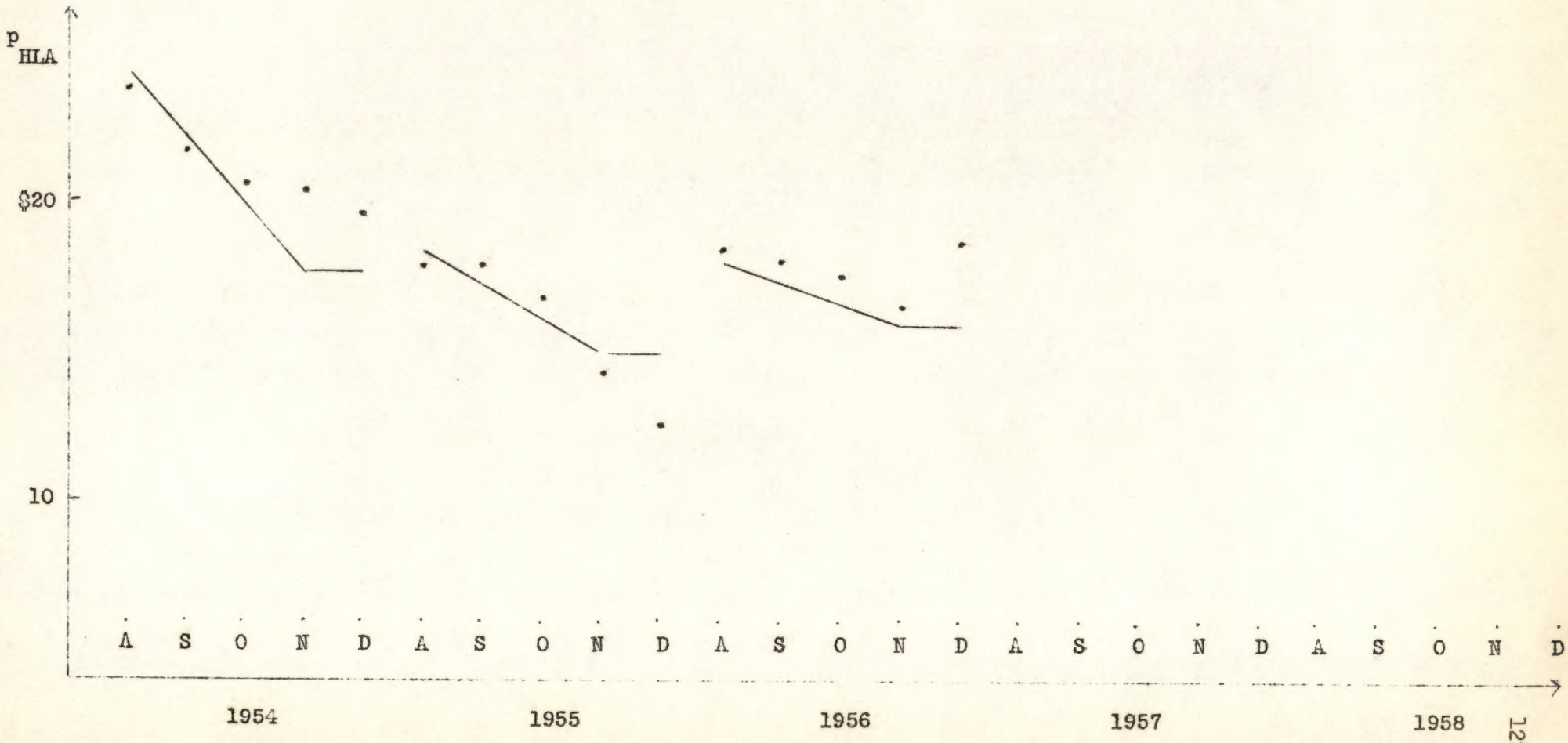


FIGURE 47 Continued



## Sources of Data

1. Livestock prices were obtained from the daily, weekly, and annual summary releases of the Market News Service, U. S. Department of Agriculture.
2. Production data for the livestock industry were obtained from the Livestock and Meat Situation reports and the annual release on Livestock Market Statistics and Related Data, U. S. Department of Agriculture.
3. Human population data were obtained from the P-25 series of the U. S. Bureau of the Census.
4. Income data were obtained from the Supplement to the Survey of Current Business of the U. S. Department of Commerce and from numerous other publications carrying these data for past years.